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Present Position OF THE TREATMENT OF HYPERTROPHIC PYLORIC STENOSIS.[1]

BY F. JOHN POYNTON, M.D., F.R.C.P. LOND.,
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J. M. BRYDSON, M.S., B.S. DURH.,
LATE HOUSE SURGEON, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.

WE feel that there may be some danger that the subject of pyloric stenosis in infancy may seem threadbare, for much has been written upon it of late. In spite of this, however, there apparently still remains uncertainty and difference of opinion upon certain cardinal points which are of interest to physicians, surgeons, and pathologists, and we think that on this account this would be a subject in harmony with that highly prized feature of this society, its general broad outlook upon medicine. We have ourselves arrived at a definite conclusion upon the treatment of the disease, and wish to place our views before the society, though in no arrogant spirit and with no claim to originality. This conclusion we are prepared to modify if further study throws clearer light on the cause of pyloric stenosis, but in the present phase of our knowledge we believe it to offer the best results. It can be expressed in one sentence. *When once the diagnosis has been made, operate at the earliest opportunity.* This is a definite statement, and the object of our communication is to put forward our reasons based upon the exact details of our procedure and our results.

Although the physician in these cases has to work hand in hand with the surgeon, the essential step in the successful result is the surgical procedure. At the outset one of us (F. J. P.) would like to put his own attitudes to the treatment of pyloric stenosis over a period of 20 years. Brought up, when once he learned to recognise this condition, to treat it on medical lines, he soon became convinced that for some cases this was hopeless. When he came in charge of wards he had reached the stage of seeing the necessity for ascertaining which cases required operation, and then adopted the attitude of giving a trial to medical treatment in all clear cases before approaching the surgeon. Now when the diagnosis is made he at once advises an operation—a position largely due to the debt which physicians owe to such pioneers as Cautley and Clinton Dent, Still, Burghard and Rammstedt. This attitude evidently demands the necessity for making a sure diagnosis, and leads to a cardinal point.

The classical symptoms of pyloric stenosis are, as we know, projectile vomiting, visible peristalsis, tumour, and constipation. Active visible peristalsis is valuable, but for us the tumour is of the first importance. We recognise there is a decided difference of opinion upon the frequency of its detection and therefore upon its diagnostic value. Nevertheless, our conviction is that if we do not lay the greatest stress upon the tumour, we shall find in the future many cases operated upon that are not really suffering from pyloric stenosis. One of us (F. J. P.) inquired one day of a "nutritional specialist" what criterion he took as a guide in suspected cases, and was told loss of weight, but with this he did not agree.

[1] A paper read before the Medical Society of London, Jan. 28th, 1924.

EXAMINATION FOR THE TUMOUR.

Our experience has been that so far we have failed to find the tumour in only one case, though we have had difficulties with a few. In that single case our house physician had felt the tumour on one occasion. We have had no case in which death has occurred and an undetected tumour been discovered, and no case in which, when a tumour was felt, it was found non-existent at the operation. Having spoken so strongly upon this point we feel bound to give in detail our method of examination.

To relax our own muscles we sit beside the cot on the left side of the infant. The nurse gives a feed of milk or glucose water, and the left hand thoroughly warmed (a most necessary precaution) is laid flat over the epigastrium and kept motionless until it becomes a part of the abdominal wall. The edge of the liver, which is always palpable, is defined by the upper border of the index finger, and then the pylorus traced with the pads of the fingers used with the lightest possible pressure. The difficult tumours are those lying high up under the edge of the liver, but they can usually be detected on inspiration by their harder consistence. Another difficult one is the tumour that relaxes quickly. Some feel like the tip of the nose, some run transversely into the stomach wall, and some lie low down further to the right than usual toward the renal region. When we are sure that we feel the tumour, we only wait for the child to recover from any collapse due to the journey to the hospital before commencing the procedures for operation. We do not, as a rule, give bismuth meals, because our experience has been that they may do harm to an infant who has no reserve power, and they do not in ordinary cases tell us more than we can discover by clinical examination.

It may be asked, Do you never meet with a case in which you are not sure that there is a tumour, and yet from other symptoms you believe it to be a case of stenosis? Our answer is that, so far, in our series we have met with some doubtful cases, but with the one exception already mentioned, when we have not felt a tumour there has not been an operation, and these cases have either recovered or, if they have died, have not been cases of pyloric stenosis. Possibly we have been unusually fortunate, and one of us has met with two cases (not in our joint series) in which there was no tumour felt, but in these the remarkable peristalsis in association with the other symptoms led to a right decision. The great hindrance to a successful result has been, in our experience, the *duration* of the symptoms, and we shall later support this statement in an analysis of our statistics.

A strong infant with a long history of starvation is more likely to succumb than a weakly one with a recent history. One group to which further allusion will be made is that in which in the chronic disease there supervenes an acute exacerbation of vomiting with prostration and even fever. In such cases we at once press on operation. In practical terms we consider no case too ill for operation, for it is our experience that those that seem the most unfavourable may make easy recoveries, while the more promising ones may prove to be the most anxious. We look upon it, however, as essential to have a most careful plan of procedure, and shall give this in detail, not because we believe it to be infallible or beyond improvement, but because it has been very successful, was gradually evolved by sheer experience, and may be helpful to any who have not had the same opportunities. It has been evolved from the difficulties we have encountered and which we now enumerate.

DIFFICULTIES.

(1) Extreme illness and shock; (2) accidents during operation; (3) neglect of precautions in after care—viz., to avoid chill, to guard against high fever, and shock; (4) enteritis; (5) marasmus, in cases with a long history. Lastly, the physician is not anxious himself to perish from "case stenosis" as the result of the inroads of surgeons upon his territory; and if all the elaborate details concerned with the operation

were undertaken, success might, it was thought, follow without any surgical help. This was tried on a breast- and hand-fed infant respectively. In each case it was found that when the diet was raised above the starvation level the symptoms recurred, and operation was called for. One baby survived, the other died unable to endure the second period of partial starvation involved. These two cases were not considered to be fair to the surgeons, and they are not included in the series; but apart from them there has been no mutilation of our statistics.

In discussing the operative procedure adopted in these cases, and in presenting our results, we desire to make full acknowledgment of our indebtedness to those other surgeons, especially Rammstedt and Burghard, who have helped to improve the technique and have added to the literature of this subject in recent years. All our cases have been operated on by the "Rammstedt" method of transperitoneal section of the pyloric sphincter. We are satisfied that this method offers the quickest and safest means of relieving the stenosis. We will now describe the operation in detail:—

PRE-OPERATIVE TREATMENT.

(*a*) *Gastric Lavage.*—It is most important to have the stomach as empty and as clean as possible at the time of operation. A distended stomach makes for operative difficulties, while the passage of stagnant stomach contents into the intestine, immediately the pyloric stricture is relieved, is most undesirable. A short course of gastric lavage is therefore an essential preliminary, especially in long-standing cases with very dirty stomach contents. The final wash out is done one hour before operation.

(*b*) *To Combat Shock.*—Subcutaneous infusions of saline with glucose (2 per cent.) are administered usually twice, (1) 12 hours, (2) two hours before operation, 1½ oz. being run into each axilla. The baby's limbs are bandaged in cotton-wool, and the trunk warmly wrapped. The operating room is specially heated (75° F.).

(*c*) The last feed is given four hours before the operation.

(*d*) No preliminary hypodermic injection is used.

ANÆSTHETIC.

Ether and chloroform are contra-indicated by the grave danger of acidosis in these starved infants. We now use gas and oxygen in all cases. With this we have frequently combined local infiltration of the abdominal wall (skin and rectus sheath) with novocaine and adrenalin (novocaine 2 per cent., adrenalin sol. 1 in 1000, 5 minims to 1 oz.) with the object of diminishing shock and rendering the closure of the peritoneum more easy. Five of the worst cases in the total series were successfully operated upon under the local infiltration alone. We believe it to be a valuable addition to gas and oxygen in collapsed infants.

Position.—The baby is laid on a well-protected hot-water bottle, so as to throw the epigastrium into prominence.

OPERATION.

The abdomen is opened above the umbilicus to the right of the middle line by incising the rectus sheath and reflecting the muscle outwards. The stomach is picked up from beneath the liver edge and the pylorus delivered. Escape of intestine is prevented by a narrow "pack" tucked into the lower angle of the wound, and as little of the stomach as is necessary is brought out of the abdominal cavity. We employ the following method in dividing the sphincter: The operator fixes the pylorus with his left thumb and forefinger, while the assistant gently grasps the stomach; the "avascular" line on the anterior surface of the pylorus, close to its upper border, is identified. Occasionally this line may be invaded by a vascular twig, and we always attempt to circumvent such a little vessel if met with. With a clean scalpel the incision in the pylorus is begun, dividing the peritoneum and just entering the muscle layer. The muscle section is completed by using a pair of closed scissors as a blunt knife. This instrument divides the muscle quite easily and cleanly, and cannot injure the mucous membrane, as the latter bulges into the gap. The section must, of course, completely divide the pylorus, and special attention is always given to both ends of the incision with the object of ensuring this. Having completed the section, the cut edges of the sphincter are undermined, and the gap widened so as to ensure that the mucous membrane will bulge and herniate well up into the gap.

The pylorus is now carefully inspected for any bleeding-point. Occasionally a small vessel may ooze in the subperitoneal or in the submucous coat. Usually a pinch with forceps suffices to stop this. If necessary it may be underrun with a fine needle and catgut, or a muscle graft taken from the rectus abdominis may be applied. In our experience oozing of this type is rare. We believe that blunt section of the pylorus and thorough undermining by the method described are most important details in minimising the possibilities of hæmorrhage. In a personal experience to date of 65 cases, one of us (T. T. H.) has very rarely been delayed by a bleeding-point at the time of operation, and there has been no fatality from hæmorrhage in his practice. The pylorus having been returned to the abdominal cavity, the abdomen is closed in layers with fine catgut.

The peritoneal layer is sometimes troublesome, especially if the child is not taking the anæsthetic well. The omentum, aptly described by Mr. F. F. Burghard as "seaweed," floats up into the wound, and may make this the only really difficult step of the operation. The incision is always closed from below upwards, as by this means full use is made of the liver as a retractor in putting in the final stitches. The skin incision is closed by a single subcutaneous stitch of silk-worm gut. The wound is sealed with Whitehead's varnish and a small dressing and bandage are applied. The infant is rapidly enveloped in a warm blanket and carried back to bed. The operation lasts about ten minutes in the average case. Speed is certainly valuable, but in the words of Sir Berkeley Moynihan, it should be the "daughter of experience and not the parent of disaster." It should never replace gentleness and delicacy of handling, which are first essentials.

POST-OPERATIVE TREATMENT.

The immediate post-operative concern is to keep the infant warm. If the condition is poor the lips are rubbed with brandy, and oxygen is administered occasionally. The temperature is recorded hourly (Fig. 1), and if it rises above 102° F. an ice-bag is put on the baby's head. This controls the development of post-operative hyperpyrexia, which is an occasional complication. Further subcutaneous saline is administered if necessary, but must be used with discretion for fear of "waterlogging" the lungs. In the case of hospital patients, we advocate early discharge to their homes.

Feeding.—We append our exact methods of post-operative feeding (*a*) in a breast-fed infant, and (*b*) in a bottle-fed infant.

Feeding of Pyloric Stenosis After Operation.

(A) *Breast-feeding.*

Operation 10.30 A.M., return to ward 11 A.M., milk drawn from mother four hours after.

First day: 3 P.M. to 8 P.M., ℥i. hourly; 9 P.M. and 10 P.M., ℥ii; 11 P.M. and 12 P.M., ℥iii.

Second day: 1 A.M. and 2 A.M., ℥iii.; 3 A.M. and 5 A.M., ℥iv.; 7 A.M. and 9 A.M., ℥vi.; 11 A.M., 1 P.M., and 3 P.M., ℥i. (to breast for three minutes, time varies); 5 P.M., ℥iss. (to breast for five to seven minutes); 7.30 P.M., ℥iss. Continue 2½-hourly for 12 hours.

Third day: 7.30 A.M. (3-hourly for 12 hours), breast five to seven minutes; 7.30 P.M., 3-hourly, breast for ½ hour or 20 minutes.

These babies are weighed before and after feeds for first few days.

(B) *Bottle-feeding. A Reliable Skimmed Dried Milk.*

Operation 10.30 A.M., return to ward 11 A.M., four hours after commence feeding.

First day: 3 P.M. to 8 P.M., ʒi. hourly; 9 P.M. and 10 P.M., ʒii.; 11 P.M. to 1 A.M., ʒiii. hourly.

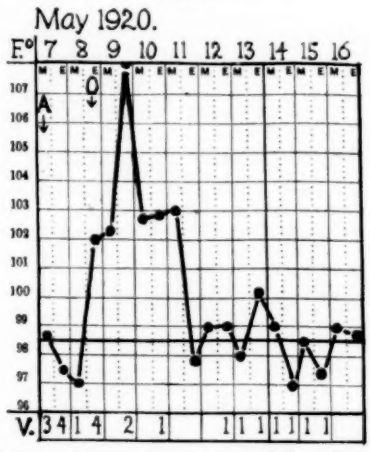
Second day: 2 A.M., ʒiii.; 3 A.M. and 5 A.M., ʒiv.; 7 A.M. and 9 A.M., ʒvi.; 11 A.M., 1 P.M., and 3 P.M., ℥i.; 5 P.M. and 7.30 P.M., ℥i. ʒii. Continue 2½-hourly for 12 hours.

Third day: (Dried milk (half cream), ʒi.–℥i.), 7.30 A.M., ℥iss., 3-hourly for 12 hours; 7.30 P.M., ℥ii. 3-hourly. Increase to ℥iiss. or ℥iii., according to age.

RESULTS.

In presenting our results we desire to make it clear that our cases have been in no way selected. Certain diagnosis of true hypertrophic stenosis has been the only criterion. Our lists, therefore, include desperate and acute cases. Certain acute exacerbations of

FIG. 1.



Temperature chart, case of congenital pyloric stenosis. Illustrating hyperpyrexia immediately after operation.
V = Times of vomiting.

symptoms have been alluded to as forming no contra-indication to operation. Indeed, under certain circumstances such manifestations, in our judgment, indicate that surgical intervention is urgent.

A case may be primarily acute, or acute symptoms may supervene in a more chronic case. In the primarily acute case the march of events is excessively rapid. All the symptoms from the outset are very severe. Vomiting is copious and incessant. Within a very few days of the actual onset the infant becomes alarmingly collapsed. Such cases are surgical emergencies. The pylorus is found small and stony-hard. In spite of the collapsed condition these children do well. In some other cases, which have presented a quieter course, acute exacerbations occur, associated with severe outbursts of vomiting, and frequently with rise of temperature. In such cases the temptation is to postpone operation until the acute symptoms wane, but there is more than a chance that the baby will die before they do so. We always regard these cases as urgent also. We have on several occasions operated on a child whose temperature has been up to 102° F. or more, and the results have been most gratifying.

The total number of our joint series, with which we are mainly concerned in this present paper, is 20. Of these, 16 have been cured, four have died. This gives us a percentage of recoveries of 80 per cent., and a mortality-rate of 20 per cent. Since August, 1921 (i.e., during the last two and a half years) we have lost only two cases out of a total of 16. We wish to refer briefly to the fatalities:—

1. Our first case, in July, 1920, was a bottle-fed infant aged 9 weeks, with a complete harelip and cleft palate, in whom the symptoms had existed for 60 days. The operation was performed under local anæsthetic, with a small amount of ether. The infant did well until the third day, when it collapsed and died. Post mortem the pylorus was patent, and there was no bleeding. This was a very wasted infant with a severe associated facial deformity. Note the long duration (60 days).

2. Our fourth case, in August, 1921, was a bottle-fed baby aged 10 weeks, in whom the symptoms had been present for 44 days. The infant was extremely emaciated and weighed only 6 lb. The operation was performed under N_2O and oxygen. The baby never really rallied, and died after 48 hours. Post mortem the pylorus was patent and there was no bleeding.

3. Our eighth case, in June, 1922, was a bottle-fed infant aged 6 weeks who had vomited since birth. The diagnosis was in doubt in this case, and in consequence there was some delay before operating. The pylorus was found high up under the liver. Death occurred from shock 24 hours after operation. Post mortem the pylorus was patent, and there was no bleeding. The baby was found to have a double hydronephrosis of advanced degree.

4. Our eighteenth case, in June, 1923, was a twin baby aged 15 weeks, in whom the symptoms had been present practically from birth—i.e., the duration was certainly over 100 days. The infant's condition was very poor. The operation was performed under N_2O and oxygen. The pylorus was enormously thickened, as was the whole stomach wall. All went well until the third day, when an infective enteritis developed. To this was superadded on the fifth day an ulcerative condition of the mouth, pharynx, and larynx; swabs showed no Klebs-Loeffler bacillus, but some "suspicious bacilli." Death occurred later on the fifth day. Post mortem the pylorus was patent, and there was no bleeding. The intestines showed a mild enteritis. The larynx and œsophagus as far as the cardiac orifice were covered by a grey membrane (further swabs showed no Klebs-Loeffler bacillus). Death in this case must be ascribed to an intercurrent diphtheroid infection. We would emphasise the long duration—100 days. Such an infant maintains its hold on life by the slenderest of threads.

We submit that fatalities in four such cases as those related can hardly be said to shake one's confidence in the value of the operation. But it may be said that our joint series of 20 cases is too small, and we wish therefore to take this opportunity of presenting the results of a much larger series; this comprises the first 55 cases which have been operated upon by one of us (T. T. H.) during the last four years. This total number includes the previously quoted 20 cases. In all, the operative details have been identical, and the post-operative feeding has only differed in minor details according to the predilections of individual physicians. We are indebted to our medical colleagues for permission to quote these cases.

FIG. 2.

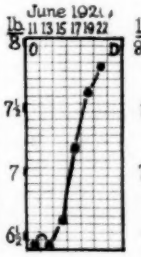


FIG. 3.

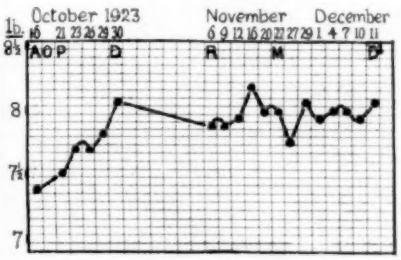


FIG. 2.—Weight chart from a case of pyloric stenosis; duration 14 days. Illustrating rapid gain in weight after operation. O = Operation. D = Discharge.

FIG. 3.—Weight chart of a case of pyloric stenosis in which the symptoms had existed for 60 days, illustrating the slow gain in weight after operation.

A = On admission. O = Operation. D = Discharged. R = Readmitted. M = Humanised milk 3 oz. every 2½ hours. D¹ = Discharged improving gradually.

Of the 55 cases, 41 were cured and 14 died. The total recovery-rate has therefore been 71 per cent., and the total mortality-rate 29 per cent.

It is gratifying to our efforts to note the improvement in the results by years. Thus, in 1920 and 1921, in a total of 20 cases, the mortality was just under 45 per cent. In 1922 and 1923, in a total of 35 cases, the mortality was just under 15 per cent.

What are the factors which influence the results of the operative treatment of pyloric stenosis? We are

convinced that there is only one of paramount importance—duration of symptoms. Those cases in which early diagnosis is followed by prompt operation very rarely give us any anxiety.

The "Rammstedt" operation, if carried out as we have described, has few risks for the infant in fair condition. In such there is no shock. There need be no hæmorrhage or other surgical complications. The subsequent progress is rapid and there is no prolonged period of anxiety (Fig. 2).

All the troubles arise from delay, which fosters disaster in two ways: (1) The infant's general condition becomes progressively depressed, so that the actual operation risk from shock becomes correspondingly increased. (2) The infant's intestinal functions become progressively atrophied from disuse. Recuperation of digestive power must be correspondingly prolonged, while susceptibility to infections is increased. Hence the tragedies of "marasmus" and "enteritis," which account for half the deaths in this series.

The influence of this factor of time is clearly shown in our cases. We have arranged them in groups for the purpose, estimating the duration of the disease from the first onset of symptoms to the dates of operation. We have made three groups: (1) Duration 50 or more days, (2) duration 25–50 days, (3) duration under 25 days.

In group (1) (duration 50 or more days), total 11 cases. Result: Cured 4, died 7. Mortality-rate, 63·6 per cent.

In Group (2) (duration 25–50 days), total 13 cases. Result: Cured 8, died 5. Mortality-rate, 38·5 per cent.

In Group (3) (duration under 25 days), total 31 cases. Result: Cured 29, died 2. Mortality-rate, 6·4 per cent.

Of the total 14 deaths: Seven occurred within 48 hours of operation, and were due to post-operative collapse, seven occurred later at varying periods up to one month from infective enteritis or marasmus. All were examined post mortem, and in no case was there any perforation or undue hæmorrhage as a result of the pyloric incision.

But it is not only to the fatalities that we would point for evidence of the ill-effects of delay. The cases in Groups (1) and (2), which recover, do so reluctantly (Fig. 3). Convalescence is slow and anxious. Often diarrhœa occurs, which is sometimes severe. Altogether, in our experience, it is beyond question that the cases of long standing are in a category by themselves in point of seriousness.

CONCLUSIONS.

1. That in the present state of our knowledge (or ignorance) of the pathology of pyloric stenosis, operation offers the most speedy and certain cure of the disease.
2. That the operation of choice is Rammstedt's.
3. That the best results are obtained when the operation is performed at the earliest possible moment after the onset of the symptoms.
4. That the only absolute diagnostic sign is the feeling of the pyloric tumour, without this sign having been elicited operation is only justified in rare instances.
5. That in a breast-fed infant, where symptoms and signs develop suggestive of pyloric stenosis, the infant should not be weaned until a definite or negative diagnosis can be made, because experience has shown that feeding with breast milk is of great assistance to recovery.

THE Memorial Roll of the Royal Army Medical Corps, designed by Mr. Graily Hewitt, will be exhibited in Room 72 of the Victoria and Albert Museum (Department of Engravings, Illustration and Design) from Feb. 1st to 29th.

A RECEPTION will be held at the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W., on Tuesday, Feb. 5th, at 5 P.M., to meet medical officers visiting this country under the auspices of the Health Organisation of the League of Nations.

NEW METHODS FOR THE STUDY OF THE PATHOLOGY AND TREATMENT OF TUBERCULOUS DISEASE.

BY SIR ALMROTH E. WRIGHT, M.D. DUB., F.R.S.

(With Coloured Plate.)

BEFORE any substantial improvements can be made in the treatment of tuberculous infection two things must be done. We must extend our immunological knowledge so as to discern what is lacking in the patient, and what requires to be done for him. And when we have in the light of such knowledge selected our treatment we must use sure means for discovering whether our therapeutic procedures fulfil their purpose. We must part company with those who overleap by a *saltus empiricus* intermediate events, and undertake to adjudicate by far-off indirect and often ambiguous clinical results; and we must set ourselves instead to follow out step by step, using laboratory methods, the train of effects produced by treatment—adhering doggedly to the *passus scientificus lutus*.

Here, as in all other infections, the proper way to begin will be to find out whether the infective agent can cultivate itself in the blood, in the blood fluids, and in the blood fluids in the presence of leucocytes. In previous papers [1] dealing with staphylococcic and streptococcic infections a general technique for these purposes has been described. That technique with certain changes can, as will be seen, be employed also in researches on the tubercle bacillus.

Hæmoculture in Slide Cells and Capillary Tubes.

The method consists in implanting graduated dilutions of a bacterial culture into the blood, and then filling this implanted blood into capillary tubes, or into slide cells. These last (vide loc. cit.) are shallow cells made from ordinary microscopic slides held apart and subdivided into compartments by strips of paper of standard thickness. Where staphylococci are

[1] THE LANCET, 1923, i., 365, 417, 473.

Descriptions of Illustrations on Coloured Plate.

FIG. I.—Normal blood implanted with a heavily centrifuged suspension of tubercle bacilli and incubated for nine days on a slide-cell. Marginal portion of the clot. The hæmoglobin has here been dissolved out from the red corpuscles by water, and the preparation has been stained by carbol fuchsin, followed by methylene-blue. The more copious tubercle growth at the inferior margin is related to the blood-clot having along this edge been in contact with air. Here, as also in the specimens depicted in Figs. III., IV., and VII., practically all the polynuclear and many of the large mononuclear leucocytes have emigrated to the walls, and only the small lymphocytes remain behind in the clot.

FIG. II.—Capillary tubercle-implanted plasma-clot. The preparation was obtained by implanting normal plasma with a centrifuged suspension of tubercle bacilli, by drawing this up into the stem of a capillary pipette, and incubating for four days. The clot was then simply blown out, dried on a slide, and stained with carbol fuchsin. The illustration shows a portion near the end of the clot where the microbes would have access to oxygen.

FIG. III.—Portion of a slide-cell clot from normal blood lightly implanted with tubercle and then incubated for 24 hours. Shows the aggregation of mononuclear leucocytes round a clump of tubercle bacilli.

FIG. IV.—Portion of a slide-cell clot similarly implanted and incubated for 48 hours. The specimen shows commencing "cavernation" round an agglomeration of leucocytes which are centred upon a group of tubercle bacilli.

FIG. V.—Portion of a capillary plasma-clot which was lightly implanted with tubercle bacilli. This was lodged in an "unlined" portion of a capillary stem and was then incubated for three days. The tubercle bacilli are here growing out unrestrained.

FIG. VI.—Another portion of the same clot which was lodged in a leucocyte-lined portion of the capillary stem. The leucocytes have here migrated from the walls on to the plasma-clot. Associated with this "admigration" there is a notable restriction of the tubercle culture.

FIG. I.

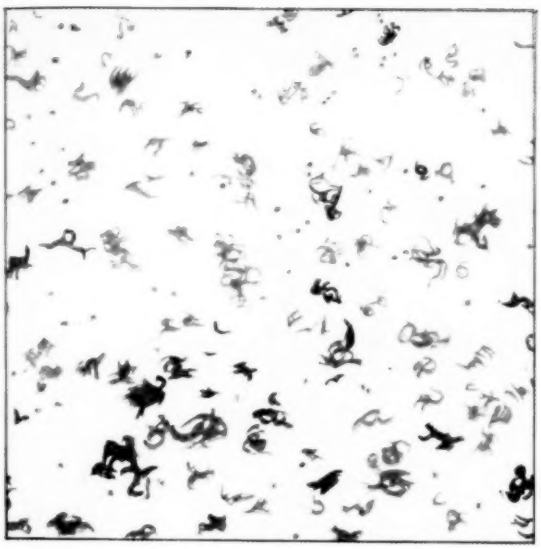


FIG. II.

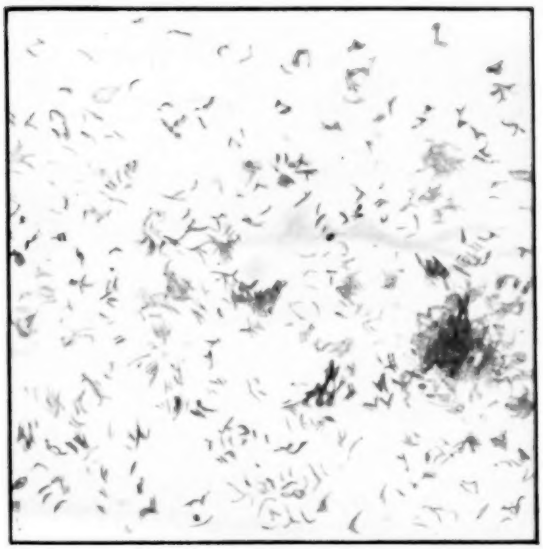


FIG. III.

FIG. IV.

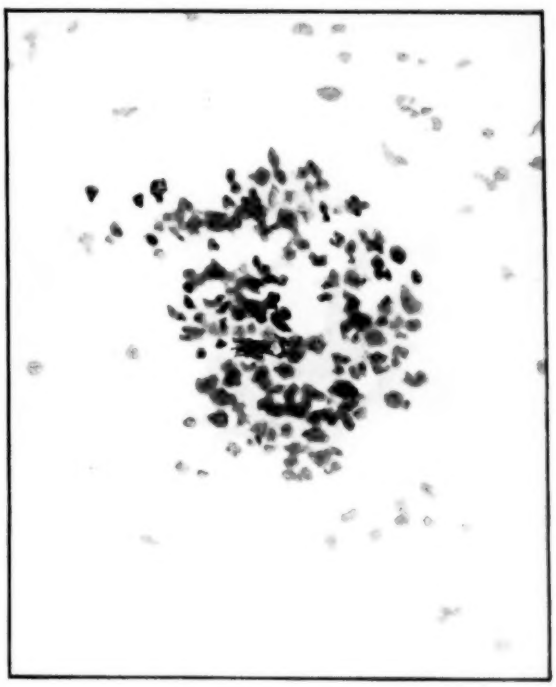
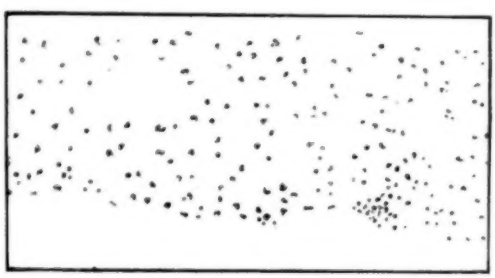


FIG. V.

FIG. VI.



SIR ALMROTH WRIGHT: PATHOLOGY AND TREATMENT OF TUBERCULOUS DISEASE.

implanted into human blood the survivors grow out into colonies which show up as bleached foci encircled by broad purple rings. In the blood of rabbits each staphylococcus colony is surrounded by a broad halo of hæmolysis. Again, in human blood colonies of hæmolytic streptococci may be ringed round with areas of hæmolysis. When tubercle bacilli are incubated in human blood the hæmoglobin of the red corpuscles is unaffected. We cannot, therefore, as in the case of staphylococci and streptococci, tell by simple inspection whether a culture has been obtained.

To decide that we must dissolve out the hæmoglobin from the clot, and then stain and examine under the microscope. In the case of slide cells we prise the slides asunder under water, add a little acetic acid or saponin, and then, when hæmolysis is complete, transfer our thin slabs of clot, which now look exactly like microscopic sections, to clean slides. We then fix them to the glass by drying in an incubator, and stain with carbol fuchsin, counter-staining with methylene-blue. Blood-clots from capillary tubes—we may conveniently call these *capillary clots*—are treated in exactly the same way. When tubercle-implanted blood-clots thus prepared are microscopically examined—incubated being compared with unincubated specimens—it is instantly seen that the tubercle bacillus grows out in the blood. Even after so short a time as 24 hours the single microbes which were implanted and which persist as such in the unincubated clots have in incubated clots grown out into groups of 2 to 5. After 48 hours the clumps of tubercle bacilli are sufficiently large to be easily visible under the low power (magnification of approximately 1 × 100). An idea as to how vigorously the tubercle bacillus grows in blood can be obtained from Figs. I. and II. Fig. I. represents a portion from the edge of a slide cell clot where (owing to the containing compartment having here been only incompletely filled with blood) oxygen had access. Fig. II. represents a portion taken near the end of a capillary blood-clot where, of course, similar conditions would prevail.

The leucocytic reactions and the histological changes which supervene in tubercle implanted clots are interesting. Polynuclear leucocytes are first attracted to the tubercle bacilli and phagocytosis follows. The tubercle bacilli now rapidly bring about the destruction of the ingesting polynuclear leucocytes and then large and small mononuclear white corpuscles collect and form in concert with the disintegrating polynuclear phagocytes large agglomerations round the tuberculous foci exactly as described by Borrel in connexion with the intravenous injection of tubercle bacilli. These agglomerates of leucocytes—described by Borrel as miliary tubercles in the making—are shown in Figs. III. and IV. A little later—in those regions where the leucocytes do not extinguish the infection—the fibrin meshwork begins to thin out and dissolve round the agglomerations of leucocytes which encompass the clumps of tubercle bacilli (Fig. IV.). The beginning of this process of *cavernation* can be seen after 24 hours and after 48 hours definite cavities have formed, and the process goes on until the slide-cell clots are everywhere perforated with holes. The decolorised clots now look like miniature sections of a lung riddled with cavities (Fig. IX.). In like manner tubercle-implanted capillary blood-clots are gradually eroded, and fall to pieces.

Ordinarily two factors—the tubercle bacillus on the one hand and leucocytes on the other—appear to coöperate in the process of cavernation. The tubercle bacillus by itself does not—this will be apparent on considering Figs. I. and II.—dissolve up the fibrin. Nor, judging by the case where leucocytes gather round insoluble foreign particles in a blood-clot, do aggregations of unpoisoned leucocytes disintegrate the fibrinous structure. Nor, again, do the aggregations of leucocytes which may collect round staphylococcus colonies dissolve it. Cavernation would thus appear to be due to a quite special chemical action exerted upon leucocytes by the tubercle bacillus. In all probability trypsin derived from the disintegrated leucocytes comes into operation on the fibrin. In exceptional cases, where the blood has been very heavily implanted with tubercle, cavitation occurs without any apparent intervention of leucocytes. Here we have cavities filled with badly staining material in which tubercle bacilli are lying loose. Such cavitation is probably produced by a caseating necrosis.

Plasma Culture.

The tubercle bacillus having been found to grow freely in human blood, implantations were made into serum. The event, however, did not conform with expectation. The tubercle bacillus does not proliferate appreciably in serum. Implantations were, as a next step, made into plasma. The technique employed was to obtain blood from the finger to aspirate this into a paraffined pipette, and to centrifuge this without delay in a centrifuge bucket filled with cold water. This done the supernatant plasma was pipetted off, implanted with graduated dilutions of the centrifuged tubercle bacillus suspension, drawn up into capillary tubes, and incubated—control tubes being kept at the temperature of the air. The plasma-clots were then, after one or more days, blown out, were carefully washed to remove the adhering serum, and were then stained with carbol fuchsin and counter-stained. A mere glance at such preparations suffices to show that the tubercle bacillus grows very freely in the plasma-clots (Figs. II. and V.). And when these are compared with blood-clots similarly implanted it is immediately seen that the tubercle bacillus proliferates much more freely and more uniformly in the former than in the latter. Whereas in the case of the blood-clot the colonies are irregularly distributed and come up larger and smaller according as the conditions are in one region favourable and in another unfavourable, in the plasma-clot the colonies are regularly distributed, and are much more of one size. This is obviously what one would expect of microbes implanted into a nutrient medium which was everywhere favourable to their growth.

It would be improper to infer from the fact that the tubercle bacillus proliferates vigorously in a plasma-clot that it is cultivating itself in plasma. In the plasma-clot (and, of course, the same applies to the blood-clot) the microbe is in reality cultivating itself in a medium of serum. The proper conclusion from the facts would apparently be that the tubercle bacillus obtains from the fibrin of the clot some essential nutrient element which is not found in the serum.

Influence Exerted by Leucocytes Upon the Growth of the Tubercle Bacillus.

We have already seen that the tubercle bacillus grows more copiously and in more uniform distribution in the plasma-clot than in the blood-clot, and we have further seen that in the blood-clot the leucocytes aggregate round the implanted tubercle bacilli, and that the polynuclear leucocytes in particular ingest them. It was, however, desirable to determine by direct experiment whether we can by bringing in the agency of leucocytes check the growth of the tubercle bacillus. This can be put to the test in two different ways. It can be tested by drawing up tubercle-implanted plasma into leucocyte-lined capillary tubes, and comparing the growth in such tubes with that obtained in ordinary unlined capillary tubes. Leucocyte-lined tubes are made by filling blood into ordinary capillary pipettes, incubating, so as to allow the leucocytes to emigrate and fix themselves to the walls, and then drawing a stream of normal salt solution into the distal end of the capillary tube, thereby carrying the clot up into the barrel of the pipette and washing away the red corpuscles and other blood elements. Better for our purpose than tubes furnished with a complete lining of leucocytes are tubes in which only one-half of the stem is lined. And better still are tubes in which leucocyte-lined sections alternate with unlined sections. Such a disposition of leucocytes is obtained by drawing up

into the pipettes an appropriately interrupted column of blood.

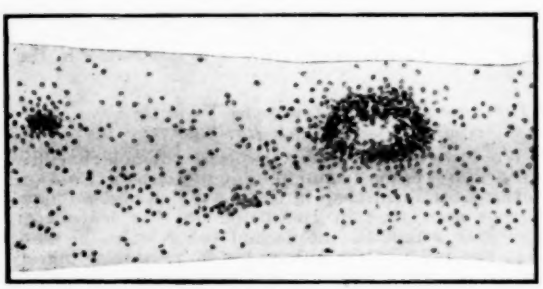
When tubercle-implanted plasma coagulates in a lined tube the leucocytes transfer themselves by *admigration* to the clot and form round it a cellular

FIG. VII.

Capillary clot from tubercle-implanted normal blood, blown out after three days' incubation, and then hæmolysed by saponin and stained. Practically all the leucocytes have here emigrated from the clot, only a few lymphocytes being left behind. In association with this the tubercle bacilli have grown out unrestrained.

envelope which comes out uninjured when the clot is evacuated through the expanding upper portion of the capillary stem (Fig. VI.). We can accordingly, when we have before us a clot derived from a lined tube, very easily distinguish those regions where the microbes have been subjected to the influence of leucocytes from those where these have not come into operation. Fig. V. shows the growth of tubercle in a section of plasma-clot which has lain in an unlined region of the tube. Fig. VI. shows the growth in an adjoining lined portion. In those regions of a plasma-clot where a sufficient force of leucocytes —and here it is a question of polynuclear leucocytes only—comes into operation the culture of tubercle is,

FIG. VIII.



A similarly implanted and treated blood-clot derived from a patient with phthisis showing leucocytic agglomerations round the tubercle bacilli. In association with this there is a greatly restricted growth of tubercle bacilli.

as shown in the figures, always very much less copious than in those regions of the clot where the leucocytes do not come into play.

Another method of investigating the effect exerted by leucocytes upon the culture of the tubercle bacillus is to fill in tubercle-implanted blood into capillary tubes or flat emigration tubes and centrifuge immediately. We then obtain in the upper half of the tube plasma, and in the lower half of the tube red corpuscles intermixed with polynuclear leucocytes and small lymphocytes; and on the top of this a layer of large mononuclear leucocytes intermixed with the larger lymphocytes. When we now incubate these tubes the tubercle bacilli grow out freely in the plasma-clot; they are, when the implantation is not excessive, killed off in the substance of the red clot, and also, but not so completely, in those regions of the plasma-clot which are invaded by leucocytes. This method may be called the *method of explanting from blood into plasma.*

While it holds true generally that leucocytes exert an inhibitory influence upon the growth of the tubercle bacillus, the rule is subject to important exception. Where leucocytes succumb to tuberculous attack the growth of the tubercle bacillus is distinctly favoured. Examination of implanted blood-clots brings out the fact that polynuclear phagocytosis of tubercle bacilli is generally unsuccessful, and that it then furnishes

FIG. IX.

Photograph of a slide cell tubercle-implanted blood-clot, which was incubated for four or five days and was then hæmolysed by saponin. By "cavernation" the clot has been converted into a sort of honeycomb structure.

new foci of infection, and that the colonies of tubercle that develop from these disintegrated leucocytes are quite markedly larger than those in other regions of the preparation.

Effect of Implanting Tubercle Bacilli into the Bloods of Phthisical Patients.

When similar implantations of tubercle bacilli are made into normal blood and into the blood of patients with pyrexial phthisis—or, to speak more generally, patients who have reacted to tubercle auto-inoculations—very remarkable differences come to light. There is, in the first place, as will be seen on reference to Figs. VII. and VIII., a difference with respect to the leucocytic reaction. Whereas the leucocytes of normal blood when the blood is heavily implanted collect only sparingly round the tubercle bacillus, most of them emigrating from the clot, the leucocytes of the tuberculous patient congregate in great masses round the bacilli. In correlation with this greater leucocytic reaction a more powerful destructive effect is exerted upon the implanted bacilli, and when we compare tuberculous and normal blood, counting in each case the number of tuberculous colonies in the incubated and unincubated blood we find there is in the blood of the tuberculous patient a much larger dissolution of microbes.

There is here much food for thought. It is in the first place obvious that though there are clinical similarities between pyrexial phthisis and chronic streptococcal septicæmia the immunological conditions

are in the two profoundly different. In the septicæmic patient the hæmo-bactericidal power is as compared with the normal, very conspicuously reduced. The treatment of streptococcal septicæmia should by consequence be *epiphylactic*. In other words, it must aim at increasing the bactericidal power of the blood. The pyrexial tuberculous patient here in view has, as compared with the normal, a greatly increased hæmo-bactericidal power. *Epiphylaxis* is therefore here not the essential requirement. And we have to ask ourselves what can here be at fault and what treatment is required? The answer to these questions would seem to be that the infecting tubercle bacilli are cultivating themselves in *ecphylactic* foci, and that *kataphylactic* treatment is called for. In other words, the bactericidal agents, that is the leucocytes, should here be transported from the blood into the regions of infection. That is precisely what we do when we introduce a tubercle-implanted plasma-clot into a lined capillary tube (Figs. V. and VI.).

The essential preliminary to treatment on these lines will obviously be the prosecution of research into the phenomena of emigration. We require to study the laws that govern the emigration of the leucocytes from the blood, or, as the case may be, blood-clot. We require to find out how to make leucocytes invade the tubercle foci as they *admigrate* to the bacilli in the bloods of tuberculous patients. And we require to study generally the chemotactic properties and the migrational movements of the different species of leucocytes.

Comparison of Normal Blood Inoculated in Vitro with Koch's Bacillary Emulsion with Uninoculated Normal Blood.

As an inducement to other workers to take up the study of this question, it may be placed upon record here that the increased leucocytic reaction and the increased tuberculo-bactericidal power which distinguish the blood of tuberculous patients who have reacted to auto-inoculations can be obtained by the addition of bacillary emulsion to the normal blood in vitro. But in connexion with this it must be borne in mind that here, as in all immunisation, the immunising result will depend upon two factors operating in conjunction. The first is the dose of living microbes implanted. The second is the quantum of vaccine which is superadded. The following results apply to blood implanted fairly sparingly with living tubercle bacilli. With small additions of bacillary emulsion—i.e., doses ranging above and below 1 in 50,000,000 of bacillary emulsion in blood—very large reduction of the tuberculous growth is obtained. With larger doses—doses up to 1 in 5,000,000 of bacillary emulsion in blood—increased agglomeration of leucocytes round the tubercle bacilli is obtained. But with these larger doses the tubercle bacilli dispersed in the other regions of the preparation appear to grow more plentifully.

In conclusion, I desire to thank my friend and colleague Alexander Fleming, F.R.C.S., for the drawings which illustrate this paper.

A NEW METHOD OF PREPARING VACCINES.

BY DR. RÉNÉ ZIVY (PARIS).

SINCE the first vaccine was prepared by devitalising bacteria at 120° C. (antityphoid vaccine of Chantemesse and Widal, 1888) up to the introduction of the present method of successive heatings to 56°–57° C., bacteriologists have constantly been endeavouring by various means to reduce as much as possible the degree of heat necessary for sterilisation, it being known that devitalisation at a high temperature diminishes vaccinating properties and increases toxicity. I considered it probable that alteration of the albuminoid substances by a high temperature was the cause of the incomplete results and the general or local consecutive troubles usually observed. Chemical products, such as iodine, ether, phenol, used also for sterilising vaccines, seem to me to have the same inconveniences.

I have therefore considered killing bacteria by means of freezing. All previous researches on the action of continuous cold on bacteria (Pictet and Yung, d'Arsonval and Charrin) demonstrated that bacteria became accustomed to this new condition of existence, lived, and were reproduced at the lowest temperatures. The question was, therefore, to prevent such a continuation of existence, and for that purpose I submitted bacteria to successive freezings and thawings. On searching the work already published on this matter, I found in the *New York Medical Record* of 1887 an article by Mr. Prudden, reporting experiments made with a view to the sterilisation of drinking water, and his conclusions were completely in accordance with the results of my own experiments.

I succeeded in obtaining complete sterilisation by a very simple process: The cultures on gelose are emulsified in physiological salt solution. This solution is dosed with the opacimeter, 50 milliards per c.cm. The solution contained in an aluminium tube (glass tubes cannot be used, as they break and were the cause of failure in my first experiments) is placed in a freezing apparatus with a constant temperature of −18° C. This temperature of −18° C. is obtained in the interior of the aluminium tube in about one hour and a half. The tubes are left in the freezing apparatus for five hours, taken out and left another five hours at room temperature (about 16° C.). Thus freezing and thawing has taken place.

According to the species of bacteria this operation must be repeated twice for pneumococci and streptococci, four times for *B. coli*, and six times for staphylococci and enterococci. On completion of the requisite number of periods in the freezing apparatus, sterilisation is complete (as we have proved by sterility of cultures tested during the last three months). The original solution is then diluted with physiological salt solution in order to obtain the required dosage.

In the course of my experiments I found it useless to put the cultivated gelose itself into the freezing apparatus. After 20 periods of freezing the microbes were still living. In order to study the toxicity of these vaccines, I have used a mixed vaccine containing in each cubic centimetre: pneumococci, streptococci, enterococci, staphylococci, *B. coli*, each 100 mill., altogether 500 mill. bacteria; 1·5 c.cm. of this vaccine (750 mill. bacteria) were injected into the vein of a rabbit weighing 2·800 kg. and caused no trouble, not even trembling. The non-toxic dose is, therefore, over 300 mill. bacteria per kg. weight of animal. The dose I have generally employed in man is only 500 mill. bacteria.

FOOT-AND-MOUTH DISEASE IN RATS.

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AND
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ABOUT the middle of December last a number of glands, mainly pre-scapular, from cows were brought to the laboratory for examination. They had been collected by the chief city meat inspector, who considered them abnormal, and following his routine practice he sent them for examination and report. The glands were enlarged, some of them inflamed, the pulp being soft and œdematous, while others showed irregular and more or less extensive hæmorrhages. Scrapings from the glands were made, but no special changes, other than those observed with the naked eye, were present. Neither bacteria nor protozoa were found. Cultures gave growths of a short-chained

streptococcus which, at first, was best developed under anaerobic conditions; later, this organism grew quite actively as an aerobe. We did not attach much importance to this organism as no special precautions had been taken in collecting the glands. A further series of glands, received at a later date, showed exactly the same conditions.

All the glands had been taken from carcasses of cows slaughtered because they had been in contact with cases of foot-and-mouth disease. None of the animals showed any of the usual signs of this disease, and they had been sent to the abattoir as non-infected. The fact that these cows were from an infected farm or dairy added special interest to the examination, and we carried out a series of experiments which have led us to believe that some of these glands contained the virus of foot-and-mouth disease, and that the disease could be produced in some laboratory animals. The work is still incomplete, but the results so far obtained and confirmed, are, we think, of sufficient importance to justify publication.

Description of Experiment.

On Dec. 18th, 1923, a rat (*a*), a mouse (*a*), and a rabbit received a subcutaneous inoculation of a saline emulsion of the glands, and a mouse (*b*), a rat (*b*), and a guinea-pig were fed on the minced glands. They received one feed only, but the guinea-pig was also given a subcutaneous inoculation.

On Jan. 1st, 1924, the guinea-pig died. There was no evidence of any lesions in the feet or in the mouth, but all the glands in the regions of the jaws were enlarged and contained a semi-solid yellowish purulent material. There was marked injection of the intestines, and some serous fluid in the peritoneal cavity. This fluid was crowded with inflammatory cells, mainly of the mononucleated type. Cultures from this fluid and from the glands yielded a short-chained streptococcus, and a small Gram-negative coccus. Both these organisms were pathogenic to rats and guinea-pigs; the Gram-negative coccus produced very marked gelatinous œdema at the site of inoculation, but we have no evidence, at present, to show that these organisms had any causal connexion with the disease. The rabbit showed no sign of infection and is still alive; mouse (*a*) died of streptococcal septicæmia.

On the 4th, rat (*a*), which had received the subcutaneous inoculation, died. There was well-marked œdematous swelling on the dorsum of both hind feet. The tail had been completely bitten off at the root. No special lesion was noted in the mouth, and, unfortunately, the lungs, which in the later animals showed important lesions, were not examined. A rat (*c*) was vaccinated on the dorsum of one of the left hind feet with the clear serum from the swollen foot of rat (*a*); only a very minute drop of the serum was used.

On the 10th, rat (*b*), which had been fed on the cow glands, was killed. It had shown for one week marked œdema of the dorsum of both its hind feet (the right foot was held off the ground on the day on which the animal was killed). The œdematous condition was exactly similar to that observed in rat (*a*), but, in addition, there was a very distinct small vesicle with clear fluid in the dorsum of the tongue, and on the anterior under surface a definite small ulcer. The tail was very much swollen, and about half of it had been bitten off. Both lungs showed infarct-like areas of gelatinous œdema with, here and there, distinct vesicle formation on the pleural surface.

On the 12th, a rat (*i*) was fed on a second series of cow glands, and a rat (*j*) was inoculated with an emulsion from the same series of glands.

On the 16th, rat (*c*), vaccinated on the 4th, was killed. This rat had been ill for several days after the vaccination, and there was definite swelling of the vaccinated foot. This evidently was due to the irritation, and subsided in a few days; but the swelling returned and the dorsum of the opposite foot became swollen. The rat in its general condition was much improved, and would probably have made a complete recovery. On examination, besides the œdema noted, two small scars, very suggestive of ruptured and dried-up vesicles, were seen one on the under surface and the other between the toes of the right hind foot. There were two small unruptured vesicles on the dorsum of the tongue near the root, and in the lungs there were numerous irregular areas of gelatinous œdema.

On the 17th, rat (*i*), fed on Jan. 12th, was examined under an anæsthetic. The feet were red and inflamed, and there were three distinct vesicles, two of them hæmorrhagic, on the under surface of the toes of the left foot. Rat (*j*) showed distinct œdematous swelling of the dorsum of both feet.

On the 19th, mouse (*b*), fed on Dec. 18th, died. This mouse had been ill, but appeared to have recovered completely, with the exception of the tail which remained considerably thickened. On examination no lesions were found in the feet or tongue, but two gelatinous œdematous areas, similar to those seen in the rats, were present in the lungs.

On the 21st, rat (*i*), fed on the 12th, was killed. There was very marked œdema of both hind feet, especially the right foot. This was more marked than in any of the previous animals. There were definite vesicles on the under surface of both hind feet and between the toes. The tongue showed two minute vesicles, one on the lateral aspect and one on the dorsum near the root. Both lungs showed a very large number of the areas of gelatinous œdema noted in the other rats. Rat (*j*), inoculated on the 12th, was also killed; it showed, besides the œdematous swelling of the feet, several very well-marked vesicles on the under surface of both the hind and fore feet. There was no lesion in the mouth, but the œdematous patches were present in the lungs.

Summary.—Four rats which have been fed on, or inoculated with, cow glands have developed œdematous swelling of both hind feet, two have shown, in addition, clear vesicles on the under surface of the feet or between the toes, two had vesicles on the tongue, three, and one mouse, had vesicles or patches of gelatinous œdema in the lungs (the lungs of the fourth were not examined). One rat was vaccinated with a very small drop of the œdematous fluid from the foot of an infected rat, and this animal also developed the œdema of the feet, the vesicles on the under surface of the toes, vesicles in the tongue, and the gelatinous œdema in the lungs.

Discussion.

Since making these observations we have examined 80 healthy rats, and no trace of similar lesions in the feet, mouth, or lungs were found, and in a very large experience with rats no similar condition has been seen by us. The special localisation of the lesions in the feet and the tongue are similar to those found in foot-and-mouth disease; the special and unique condition in the lung has, so far as we know, never been described. The results were obtained with specially inflamed glands from cows which had been contacts with foot-and-mouth disease. With such glands no rat has failed to produce the condition.

If the condition we have produced in these rats is foot-and-mouth disease, and we see no reason to doubt this, and if the experiments are confirmed, a very important avenue for investigation has been opened up, for the following reasons:—

1. The carriage of the disease from place to place either by the infected rat itself (and we know that rats migrate over considerable distances), or by the foodstuffs in which the rats live and die, is, at any rate partially, if not wholly, explained.

2. The vesicular condition on which diagnosis at present depends may merely be a manifestation of some deeper infection—just as herpes may be an outward sequel of a pneumonia, and that the distribution for food of the flesh of contact animals may be a source of spread of the disease.

3. If the disease can regularly be produced in rats, the great difficulty of experimental investigation and the supposed risks are considerably reduced. Rats can be very easily isolated, and work in relation to the cultivation of the virus can be carried out with very little difficulty, and, in our opinion, without the slightest danger.

Our great regret is that we have not been able to experiment with material from animals known to be suffering from the disease. We have asked for it, but have been told that the risk is too great, and we therefore publish these experiments in the hope that we, or others, who are working at the subject may be given reasonable facilities to carry out a thorough investigation into a disease which has cost so much to the nation.

NOTE.—Another rat which received one feed of blood from rat (*b*) on Jan. 10th now (Jan. 22nd) shows very typical swelling of the dorsum of both hind feet, two small vesicles on the tongue, and one very typical vesicle full of gelatinous fluid on the pleural surface of the right lung.

STEINACH'S REJUVENATION OPERATION.

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OF recent years great interest has centred round the operation of ligature of the vas as a method of stimulating the output of the internal secretion of the testis. This has been due in great part to the experimental work carried out by Prof. Steinach, of Vienna, on the results of ligature of the vas in senile animals. Other workers before Steinach, and notably Ancel, Bouin, and Kuntz, had described the effect of vaso-ligature in the case of young animals, and had shown that the operation produced a state of heightened sexual vigour, but Steinach was the first to apply the method to senile animals in the hope of stimulating their failing energies. His work was done on the rat, an animal particularly well suited for experiments of this kind, owing to the fact that its life is a short one and that symptoms of age are easily recognisable. The results of his experiments were published in 1920 in a monograph entitled "Rejuvenation by Experimental Revivification of the Senile Puberal Gland."[1] The title was perhaps an unfortunate one in that it encouraged the raising of extravagant hopes and resulted in the premature exploitation of a method of "rejuvenation" that had not been sufficiently tested. However, the fact that Steinach's work was soon exploited by some of the less reputable members of the medical profession does not detract from its value and interest. Indeed, the mere fact that because of its exploitation it has received but little attention in this country is sufficient justification for such an article as the following, and for this reason no apology need be offered for dealing with the matter in greater detail.

Steinach's Animal Experiments.

In his animal experiments Steinach used white rats and crossings between these and the wild rat. The average life of these animals is 28 months, and signs of old age usually appear about the twentieth month. The indications of old age most easily recognisable in the rat are loss of weight, appetite, and energy, depressed carriage of the head, lack of interest in its surroundings, loss of pugnacity, diminution or complete disappearance of sexual vigour, and deterioration of the coat, with loss of hair, uncleanliness, and increase of parasites. These outward signs are accompanied by less obvious changes in the genitalia and particularly in the secondary sex glands, such as the prostate and vesicles. The latter instead of forming large and convoluted sacs distended with fluid, as in the young animal, appear wrinkled and shrunken in size, containing only a minimum of seminal secretion.

Previous to operations Steinach's animals were subjected to a series of tests, in order that precise data might be available for estimating any improvement occurring subsequent to the ligature. Tests of muscular energy were carried out by placing the animals' food in such a position that it could only reach it by climbing or leaping. As a test of courage young pugnacious males were introduced into the same cage and the disposition and ability to defend itself shown by the old animal was carefully noted. Sexual vigour was estimated by placing the rat in proximity to females both on heat and in the resting state. A record was also kept of the amount of food consumed in 24 hours, the weight of the animal, the condition of its coat, its ability to keep itself clean and free from parasites, the interest it displayed in new surroundings, and its general behaviour when alone in its cage.

When an accurate estimate of the condition of the animal had been reached, bilateral section of the vas between ligatures was carried out. In one or two cases, in order that a record might be kept of the condition of the internal organs, and especially of the prostate and vesicles, a laparotomy was performed at the time of ligature and subsequently when signs of rejuvenation had manifested themselves. As a rule no alteration of the condition of the rat was noted for a period of two to four weeks after operation. The first sign of change that manifested itself was a return of sexual excitement when in the presence of a female rat. With the increase in sex vigour came a renewal of pugnacity, an alteration in the carriage of the head, an increase in appetite and in muscular energy, and an improvement in the coat with a new growth of hair, especially on the scrotum and around the external genitalia. In some of the cases recorded by Steinach the return of sexual vigour was so marked in these senile animals that for a time they equalled in potency the young males. At the end of a period that was anything from five to seven months after ligature the condition of the rejuvenated animals showed signs of deterioration. Potency became less strong, muscular energy and courage declined, the appetite diminished, and signs of senility returned. These gradually became more intense, so that finally the animal sank into a condition of apathy and died, usually within a few weeks of the onset of the relapse. Not infrequently the terminal cause of death was shown post mortem to have been some pulmonary condition.

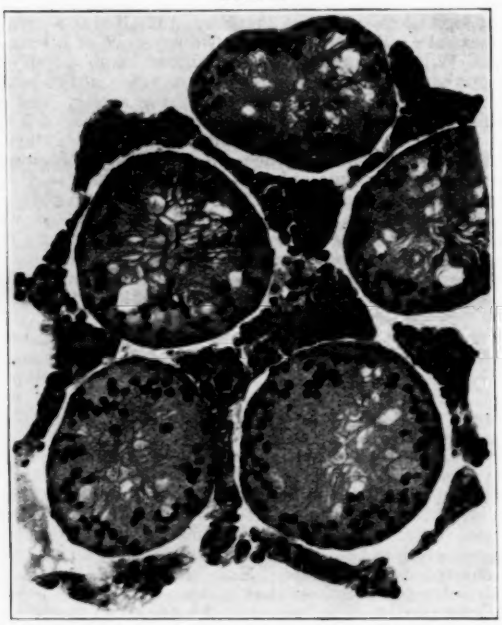
In addition to studying the general results of vaso-ligature on his animals, Steinach carried out a careful histological study of the associated changes that occurred in the testicle. He found, as had Ancel and Bouin before him, that ligature brought about a degeneration of the seminal epithelium, and an increase in the interstitial tissue. More difficult to explain is Steinach's observations that when only one of the two testicles were tied an increase of interstitial tissue was found on the untouched side as well as on the side of the ligature, although, of course, in the former case there were no signs of degeneration in the tubules. It is of interest to note that the changes in the testicle, whatever their nature, occurred not immediately after the ligature, but after a latent period of two to three weeks. (See Fig. 1.) Of still greater interest is the fact that the degeneration observed in the tubules was not permanent, but that after an interval of six to eight months had elapsed since the application of the ligature, the majority of tubules were found to have completely regenerated. This phenomenon of regeneration has also been noted by other investigators, especially by Kuntz, who found that if a dog whose vas had been ligatured were allowed to survive 142 days, and the testis then examined, the seminal epithelium was normal in appearance and active spermatogenesis was present. The fact that in these cases the vas was still dilated on the side of the ligature showed that the duct was still occluded and that the regeneration was not merely the result of a renewal of patency. Sands states that although after ligature of the vas he found an increase in Leydig cells, associated with degeneration of the tubules, he was not able to demonstrate to a certainty this regenerative phenomena. However, additional weight is given to the evidence in favour of Steinach's and Kuntz's observations by the fact that epithelial regeneration has been observed in other glands after ligature, and notably in the pancreas. Bensley has clearly proved by means of his intravitam methods of staining that although islets and acinar tissue degenerate after ligature of the pancreatic duct, both tissues subsequently become regenerated.

[1] Verjüngung durch experimentelle Neubelebung der alternden Pubertätsdrüse.

Criticism of Steinach's Animal Experiments.

A criticism of Steinach's experimental work divides itself naturally into two parts: first, a consideration of the effects produced in the general condition of the animal by ligature, and second, the relation of these phenomena to the histological changes observed in the testicle. Whatever may be the verdict that science will eventually pronounce on the effect of vaso-ligature when carried out in the human being, and however sceptical we may remain of the so-called rejuvenation obtained by exponents of this operation, it is certainly difficult to offer any explanation of the

FIG. 1.



Section through the testis of a rat five weeks after ligature and division of the vas. The section shows a marked degree of degeneration in the tubules, together with an increase in prominence of the interstitial tissue.

remarkable results obtained by Steinach in his animal experiments other than the explanation which he himself furnishes—namely, that ligature of the vas, by increasing the output of internal secretion, thereby stimulates the endocrine system generally and reawakens the waning energies of the senile animal. Whether, in addition to bringing about a condition of renewed activity, the operation of vaso-ligature has any effect in actually prolonging the duration of life is an entirely separate question, for as Steinach himself has pointed out, the span of life of a single individual can never be predetermined, so that definite proof of prolongation must inevitably be lacking. It is noteworthy, however, that several of the animals ligatured by Steinach reached an unusually advanced age, one of them living three years, and thereby surviving a brother born in the same litter and dying of normal decay by seven months. If we accept the account given by Steinach of his experimental work we are almost bound to accept his theory, for no other explanation of his results is available. Fiebinger's suggestion that the rats used in these experiments were not suffering from old age but from mange, and that the improvement in their coats and general condition was the result not of the ligature but of the good feeding and attention they received in Steinach's laboratory, is scarcely sufficient to explain his results when we keep in mind the completeness and ingenuity of the tests to which the animals were subjected before and after operation.

Surprising as are claims made by Steinach, and difficult as it may be to account for all that he describes, it is impossible to do otherwise than to accept Steinach's work with an open mind and await confirmation of his results by other observers of equal scientific standing. By the courtesy of Prof. Steinach we are enabled to publish photographs of two rats showing the effect of ligature. The descriptions are taken from his work "Verjüngung." (See Figs. 2 and 3.)

If we turn now to a consideration of the second part of Steinach's work—namely, the relationship of the phenomena of rejuvenation to the histological changes observed in the testis—we find ourselves confronted with a far more complex problem. Like Ancel and Bouin, Steinach found that ligature was followed by degeneration in the seminiferous tubules and increase in the interstitial cells. Accepting Ancel and Bouin's view that the latter cells are the sole source of the internal secretion of the testis, he naturally claimed that the histological changes found in the testis furnished additional proof that by his ligature he had stimulated the output of sex hormone. Granted the truth of Ancel and Bouin's theory, Steinach's line of argument was logical. If, however, we do *not* accept the dictum that the interstitial cells are the sole source of the internal secretion of the testis, we cannot accept an increase in the interstitial tissue as a proof that the output of sex hormone has been stimulated. In a previous article published in THE LANCET of Jan. 5th, one of us (K. M. W.) furnished arguments for believing that the interstitial cells were not the sole source of formation of the internal secretion of the testis, and for this reason we are not inclined to accept in its entirety the interpretation that Steinach places on his histological observations. The increase in interstitial material observed after ligature would, in our opinion, indicate not an increased output of hormone but an accumulation of nutrient material resulting from a diminished activity of the tubules. If this view is correct the significance of Steinach's histological findings would be lost, but the value of his observations with regard to the effect of vaso-ligature on the general condition of the senile animal remains unimpaired.

Ligature of the Vas in the Human Subject.

Since the publication of Steinach's work vaso-ligature has been tried in man with variable results. Before considering the subject it will be advisable to deal with an objection that has been raised against the possibility of ligature of the vas exercising any rejuvenating effect on man. It has been urged that at one time the operation of ligature of the vas was carried out fairly extensively as a treatment for enlargement of the prostate, and that no rejuvenating results were reported to have resulted from the proceeding. This objection is not so weighty as it would at first sight appear when one remembers the method of applying the ligature in these cases. The treatment of prostatic enlargement by means of ligature of the vas was introduced by Mears in 1894, but in ligaturing the vas so little care was exercised to avoid damaging the blood- and nerve-supply of the testicle that a large number of cases of gangrene followed. It was, indeed, partly because of these accidents that the method was afterwards abandoned. As avoidance of interference with the blood-supply of the testis is a sine qua non of the procedure advocated by Steinach, the crude method of ligature employed by Mears and his followers cannot be regarded as an instance of the application of vaso-ligature to man.

During the last six years numerous workers have employed Steinach's methods in the human subject, amongst others Lichtenstern, Peter Schmidt, Levy-Lenz, Benjamin, and Knud Sand. Owing to the fact that ligature of the vas sometimes causes the formation of a spermatocele, and that this is likely to

embarrass the blood-stream of the testis, Sand and Tournade have abandoned the operation of ligature of the vas in favour of a partial epididymectomy. Sand's technique consists in carefully freeing several centimetres of the upper part of the epididymis from the body of the testis, taking care to avoid injuring the fine vessels and nerves proceeding to the latter structure. After isolation has been completed the freed portion of the epididymis is resected between ligatures. The whole operation is conducted under local anæsthesia through a small incision in the upper part of the scrotum. Other workers content themselves with tying the vas, the ligature being placed low down near its junction with the epididymis. Equal care must be exercised to avoid damaging the blood-vessels.

Results.

Nothing is more difficult than to assess the clinical results of ligature of the vas in man. This is due not only to the absence of definite measurable data by means of which improvement can be gauged, but also to the fact that it is almost impossible in the human subject to exclude the action of mental suggestion. Moreover, difficulty is generally experienced in selecting cases suitable for operation, since pure senility unassociated with such complications as bronchitis, cardiac lesions, &c., is of uncommon occurrence, and variations and improvements in the secondary lesions are likely to obscure and confuse the issue. All that it is possible to do in the present paper is to append reports of cases treated by the writers by means of vaso-ligature, and to supplement this with an account of the results obtained by other workers. It must be realised, however, that in practically all the cases of vaso-ligature recorded by exponents of the operation of vaso-ligature the proof that improvement resulted rests on evidence of a more or less doubtful nature. On this account a very large number of observations will be necessary before it is possible to pass judgment on vaso-ligature as a method of treatment.

Of 18 cases reported by Sand, 13 were cases of senility and five cases of impotence associated with neurasthenia. Out of the 13 cases of senility the author reports nine favourable results, the criteria by means of which success was gauged being increase in the weight of the patient, renewal of mental and physical vigour, a return of virility, and a subjective or objective appearance of well-being. In two additional cases any favourable results that may have followed the operation were only temporary in character, and in two the results were entirely negative. Of the five cases treated for conditions other than senility two only resulted favourably. Benjamin reports 16 cases treated by ligature, with nine positive results, four doubtful, and three negative. Lichtenstern states that he has performed the operation n 60 patients and claims satisfactory results, although we have been unable to obtain details of his patients or to discover precisely the criteria by means of which he gauges his results. In some of Lichtenstern's cases ligature would appear to have been carried out without the patient's knowledge during the course of another operation, so that the effect of suggestion could to a great extent be excluded.

Levy-Lenz and Schmidt report cases of failure and also of success. In the opinion of the latter no good results may be expected when the testicle of the patient shows marked senile atrophy. This, of course, is only to be expected when it is remembered that the whole success of the operation is dependent on the power of the testis to respond by increased output of hormone to the stimulus of ligature. All observers remark on the variable latent period that occurs in positive cases before any improvement is noted. Sands states that in some of his cases the beneficial effect of ligature was delayed for as long as six months. Various explanations may be offered for this long latent period. Amongst others the fact that regression in the tubules does not immediately follow the application of the ligature.

FIG. 2.

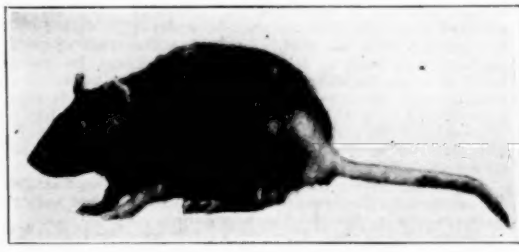


FIG. 3.

FIG. 2 shows a rat with marked signs of senility (26 months old). The emaciation, thinness of the fur, and sleepiness (eyes closed) of the animal are striking. The back, hips, upper part of the thigh, and portions of the feet are quite bald.
FIG. 3 shows a brother of the same litter, three and a half months after vaso-ligature. According to Steinach, this animal at the time of operation presented an even worse appearance than its brother (Fig. 2), so that on account of its apparently hopeless condition it was not even photographed or registered. "In spite of this complete regeneration and revival of functions took place, although after a longer latent period and more slowly than in the case of other senile animals. The animal survived the operation about ten months and its brother by eight. Three months after ligature it was a fine, strong animal with a coat completely restored, eyes that sparkled, and a youthful mien." (Photographs and descriptions kindly supplied by Prof. Steinach.)

Table showing Changes following Vaso-Ligature in Three Human Patients.

Case.	Age.	Died of—	Period elapsed since ligature.	Findings in (*a*) control testis: (*b*) ligatured testis.
1	78	Epithelioma of tongue. Cachexia.	Days. 17	Leydig cells: (*a*) Fair number; (*b*) increased. Tubules: (*a*) No spermatogenesis; (*b*) no change.
2	63	Sarcoma of jaw. Cachexia.	52	Leydig cells: (*a*) Fairly numerous; (*b*) no obvious increase in number. Tubules: (*a*) No spermatogenesis; some tubules show marked degeneration; (*b*) still greater signs of degeneration present.
3	71	Uræmia.	78	Leydig cells: (*a*) scanty; (*b*) increased in number. Tubules: (*a*) Spermatogenesis; (*b*) spermatogenesis still present; early signs of degeneration in a few tubules.

Note.—In Cases 1 and 2 there were no signs of reaction in the tubules as the result of the ligatures, and in Case 3 only very early indications of degeneration were visible. In two out of the three cases an increase of interstitial tissue had taken place.

Although numerous observations have been recorded of changes occurring in the testes of animals after ligature, no records are available of the histological changes occurring in the human subject. For this reason we took the opportunity of carrying out ligature of the vas in three cases suffering from

malignant disease and renal failure, and of examining post mortem the changes that had followed the placing of the ligature. Although the fact that the patients were suffering from severe cachexia somewhat prejudices these observations, the results obtained are sufficient to show that the time taken for marked changes to appear in the tubules of the human testis after ligature is considerable, probably two months or more.

Treatment of Paralysis Agitans by Vaso-Ligature.

Of the four patients treated by means of vaso-ligature, whose histories are given below, three were cases of paralysis agitans. The failure of every known form of treatment to alleviate this condition justified, in the writers' opinion, a trial of vasotomy. Dubief, in discussing this disease, states that "paralysis agitans has for an anatomical basis the lesions of cerebral spinal senility which differ only from those of true senility in their early onset and greater intensity." The employment of Steinach's operation, therefore, seemed particularly appropriate. Although some improvement was noted in two out of the three cases this improvement was much the most striking in the first case reported. It is true that allowances must be made in this instance for the nursing, care, and food the patient received on admission to the hospital, and that some of the improvement may be put down to these factors. However, the alteration in the patient's condition after each of the ligature operations was so marked that it is difficult to believe that it bore no relation to these proceedings. The fourth case reported was a patient in good health, who requested that bilateral ligature of the vas should be carried out for purposes of sterilisation.

CASE 1.—Patient, aged 63, admitted to St. Mary Abbots Hospital Oct. 7th, 1923, suffering from paralysis agitans.

History.—Tremors and increasing rigidity for a period of three years prior to admission. Complete loss of control of anal sphincter for two years.

Condition on Admission.—Typical mask-like expression, with general muscular rigidity and marked clonic movements of the head, trunk, and limbs (pill-rolling). Articulates only with difficulty. Patient very emaciated, completely bed-ridden, and unable even to turn in bed without assistance. A very marked stoop; when propped in a chair his body falls forward so that he has to be placed again in an upright position. Complete incontinence of fæces, the patient being conscious of desire to evacuate the bowel, but unable to wait until the bed-pan arrives. Unable to feed himself, spills fluids when trying to use a cup, and fails entirely to guide food into his mouth. Grip on both sides very poor, movements are continuous throughout the day, and the patient rests badly at night, owing to jumping in his sleep. Sexual desire decreasing for some years and completely absent for 12 months before admission.

First Operation.—On April 4th division of the right vas between ligatures. About four weeks after operation the patient began to show signs of improvement, the first manifestation being an improvement in articulation. Muscular rigidity and tremors diminished so that he was able to balance himself on his feet and to walk, but with some difficulty. However, he still found it impossible to turn round without support. Control of the sphincters was also regained, and the weight and appetite increased. The improvement continued so that he became able to feed himself with slight difficulty. The tendency to fall forward when sitting in a chair diminished, and the clonic movements disappeared entirely with the exception of those of the hands: even these were reduced in severity. Associated with the improvement in the physical condition was a more cheerful mental state and greater tranquillity at night.

Second Operation.—Owing to the patient's improvement as the result of the previous operation, there was no difficulty in obtaining his permission to carry out a similar proceeding on the opposite side. This was accordingly carried out on August 31st. Four weeks after the second operation sexual desire returned, accompanied by daily erection. The patient now stands almost straight, walks up and down stairs with ease, turns round unaided, and moves in bed without assistance. He feels himself without difficulty, and his appetite has increased still further. There is a marked diminution in the mask-like expression, a change that has been commented on by several relations. He sleeps very well, retains complete control of his sphincter, and the movements have disappeared except for some pill rolling that returns when the patient is excited. There is still some rigidity of the muscles. The grip is good for a man of his age. On Jan. 12th it was noted: "sexual desire still maintained. General condition still remains good; there is little new to add since the last note."

CASE 2.—Patient, aged 55, admitted to hospital on July 24th, 1923, suffering from paralysis agitans.

Condition on Admission.—Weakness of right arm and leg, the grip being poor on that side, and the leg dragged when walking. Right leg slightly flexed. Rigidity and marked clonic movements of right hand and arm continuous throughout day. Owing to weakness on right side is unable to hold a cup. Typical mask-like expression.

Operation.—Unilateral vasotomy was performed on the 27th.

Subsequent History.—On Jan. 12th, 1924, there is a diminution in the tremors of the right arm, which are now only marked during excitement. No improvement in the condition of the right leg, or in the grip; no alteration in mask-like expression. The patient's general condition would appear to have improved, and the tremors to have diminished, but the effect has been much less than that observed in Case 1.

CASE 3.—Patient, aged 50; in 1917, when in command of a battalion in France, noted twitchings of the right hand, which gradually increased in intensity and afterwards affected the right foot, so that in walking he failed to clear the ground with his heel. In 1918 a diagnosis of paralysis agitans was made. In spite of his illness he remained hard at work on home service, and in 1920 began to suffer considerably from nocturnal emissions, which left him the following day with an intense headache and a feeling of depression. It was for these emissions in particular that he consulted me, and at Dr. C. B. Heald's suggestion I agreed to try the effect of vasotomy.

First Operation.—Ligature of right vas, Dec. 19th, 1922. Subsequent to the operation emissions diminished very much in frequency as also did the headaches.

Second Operation.—Ligature of left vas, May 19th, 1923. Following this operation the emissions practically disappeared, and the patient no longer suffered from headaches. He still remained at work, but under great difficulties, and with a steady progression of the signs of muscular weakness and tremor. Although the operation had cured the condition for which the patient sought relief, it appeared to have had little or no influence on the general progress of his disease.

CASE 4.—Patient, aged 63, in good health, but operated on at his own request with a view to sterilisation.

Operation.—Bilateral division of the vas between ligatures, June 6th, 1923.

Subsequent History.—In order to avoid the effect of mental suggestion, little was said concerning the possibility of the operation having a beneficial effect on the general health. The patient was requested to write and furnish an unbiased statement of his general health some 5 months afterwards. The following is the letter received: "I am glad to tell you that I am quite well in health, and feel younger and more sprightly than for years. I am not so nervous, my sight has improved, and my sciatica has gone. Whether all these benefits are due to the operation I cannot say for certain, but I think so."

Conclusions.

At the present time there is insufficient material on which to base a decision as to the value of vaso-ligature as a means of treatment in man. The results of the operation appear to have been capricious, although numerous cases are reported in which benefits accrued. As, however, the data on which the claims of improvement rest are inexact and incapable of measurement, a large number of observations will be necessary before it will be possible to bring in a final verdict as to the precise value of this form of treatment. However, whatever the verdict concerning this clinical problem may be the results obtained by Steinach in his animal experiment are certainly of the greatest biological interest.

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A CONSIDERATION OF THE AFTER-RESULTS OF THE ABDOMINAL OPERATION FOR RETROVERSION.

WITH NOTES OF FIFTY CASES.

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MUCH discussion has recently arisen as to the clinical significance and necessity for operative treatment in cases of retroversion, and it has appeared to me that a useful purpose might be served by recording a series of cases showing the results of 50 abdominal operations for this condition. Retroversion is a condition of great frequency, Schroeder[1] finding it in 25 per cent. of medical cases, with no pelvic symptoms, while L. J. Stacey[2] found the uterus retroverted in 202 out of 11,000 single women examined, between the ages of 15 and 45. Its clinical significance, and therefore the necessity for and method of treatment, is, however, very variously estimated.

Previous Views of the Subject.

Looking through the literature on the subject, I have been struck by the fact that practically all writers include cases of prolapse when recording the after-results of their operations for retroversion. This seems to me to introduce an element of doubt into statistics, and to falsify the latter. In considering both the symptomatology and treatment of retroversion a definite distinction should, I think, be made between cases of retroversion associated with descensus of the pelvic viscera and weakness of the pelvic floor and cases in which no such condition is present. Possibly it is the inclusion of the former, when considering the symptomatology, &c., of retroversion that has led to such divergent opinions being held about the condition. These cases should, I think, always be included under the heading "prolapsus," as they are simply part of the mechanism in the production of this condition, and differ from the second group of cases mentioned above in that they usually give rise to a fairly definite train of symptoms—curable, as a rule, by treatment, which is always required when the condition is in the least marked.

Cases falling into the second category—only these cases, with one minor exception, are included in this paper—include those in virgins, in multiparæ, and others, where no evidence of prolapsus is present clinically, although I am aware that in this last group very slight degrees of pelvic descensus cannot always be absolutely excluded. The significance of retroversion in these cases is very difficult to estimate, and many symptoms (e.g., menorrhagia, pain in the back, sterility, &c.) which have in the past been ascribed to it can be explained by associated conditions occurring either intra- or extra-pelvically. With the possible exception of rare cases of sterility due to mechanical difficulty (Giles) and cases included under the "Bonney" syndrome, retroversion itself probably never causes a definite symptomatology, and may, I think, be looked on, when causing symptoms, as an accidental finding associated with other pelvic disorders—e.g., gross pelvic disease such as tubal inflammation, or less obvious pathological conditions such as underdevelopment of the uterus and ovaries.

I cannot, however, agree with Palmer Findlay[1] when he states that retroversion is of no clinical significance, with the possible exception of sterility, save as a step to prolapse; with A. W. Collins,[3] I would rather regard the condition, in acquired cases, as rendering the uterus more liable to disease, exaggerating minor pathological conditions which may be present, and by torsion of the pampiniform veins giving rise to an unhealthy condition of the ovaries, which are frequently prolapsed with the fundus and very tender. In the so-called "congenital" cases any existing symptoms are probably due to associated errors of development—e.g., the posterior cochleate uterus (Blair Bell), stenosis of the cervix, &c.

The era is past of those gynæcologists who considered that retroversion as a uterine displacement was a condition of marked clinical importance always requiring treatment; but this idea, I am sure, is not entirely eradicated from the lay mind, and possibly gives rise to the marked neurotic element in certain cases. The idea is clearly expressed by Palmer Findlay[1]: "For generations women have been led to believe that displacements of the uterus gave rise to all manner of local and general symptoms, and now, when informed by a physician that the 'womb is out of place' they are disposed to rationalise all complaints on the basis of the displacement. Have we not all observed cases in which retroversion gives rise to no pelvic disorder until, through suggestions, the displaced uterus becomes a pain-pathway for neurosis in a woman who has acquired nervous instability from overstress?"

That operative treatment in the past has not always been satisfactory is shown by the numerous operations—I believe they number more than a hundred—which have been devised for the cure of the condition. It is my object here not to extol any one of these or to suggest another, but rather to attempt to estimate the benefit obtained, if any, from some simple abdominal operations, as distinct from the plastic vaginal operations commonly performed. Two varieties of "sling" operation—viz., Kelly's modification of Gilliam, and Mayo's internal Alexander—and a simple method of shortening the round ligaments have been used in the series I am about to describe.

Details of the Cases under Consideration.

The cases in my series were all operated on in hospital between the years 1916 and 1921 inclusive. Their clinical histories were obtained from hospital records, while information as to their present conditions was elicited by means of a written questionnaire of the following nature:—

1. Are you cured by the operation? If not,
2. Were you relieved by the operation, and if so, how long did this relief last?
3. Do you complain of anything now?
4. Have you had a child since?
5. Have you had a miscarriage since?

A request to attend hospital for examination was appended, and over 90 cases were addressed. Answers were obtained from 50; these cases only are included in the series.

State, Age, and Multiparity.—Six of the patients were single; 44 were married, of whom 18 were sterile, including 2 who had had miscarriages only; 26 had borne children. Their ages, in periods of five years, were as follows: Aged 20–25, 6; aged 25–30, 12; aged 30–35, 18; aged 35–40, 8; aged 40–45, 4 aged 45–50, 2.

Symptoms.—The subjective symptoms were as follows, and were rarely single, two or more being usually complained of by the same patient. The duration of symptoms was difficult to estimate, many patients stating that they had "always" had their "trouble," but it appeared to vary between three months and three years. Complaint was made as follows:—

Symptom.	Cases.
Menorrhagia	25
Dysmenorrhœa	21
Constant pain (back or side)	41
Sterility	18
Dyspareunia	3

Operations Performed.

In 19 cases intraperitoneal shortening of the round ligaments was performed, the round ligaments being folded on themselves for half an inch sufficient to render the ligaments tense and hold the fundus

forward in the anteverted position. In the remaining 31 cases sling operations were performed, 10 by Mayo's internal Alexander method, loops of round ligament being withdrawn through the peritoneum opposite the internal abdominal ring, and stitched to the anterior rectus sheath; and 21 by Kelly's modified Gilliam method, loops of round ligament being withdrawn through peritoneum and rectus muscle and joined together beneath the fascia.

In this series of cases other pelvic complications were found in 31, or 62 per cent., of the cases, multiple lesions being present in many instances. They were as follows:—

Symptom.	Cases.
Chronic appendicitis	4
Cystic ovaries	10
Tubal occlusion or inflammation	3
Pelvic or peritubal adhesions	12
Prolapsed cæcum or colon	3
Uterine fibroids	3
T.B. iliac glands	1
Hypertrophied cervix	1

This is a lower percentage of complications than is given by most writers; Palmer Findlay,[1] for example, finds in his series of 480 cases only 20, or 4 per cent., uncomplicated. The difference is due, I think, to my having excluded cases of prolapse as far as possible.

After-results of Operation.

Answers were obtained from 50 patients, of whom 27 attended at hospital for examination and 23 sent written replies only. Ten (or 20 per cent.) expressed themselves as cured, 26 (or 52 per cent.) as relieved, 14 (or 28 per cent.) remained in statu quo. I have labelled cases "cured" when the patients so described themselves or no longer complained of any symptom referable to the pelvis. Where sterility was the only symptom at the time of operation I have not considered the patient cured unless she has since conceived; but where sterility is complained of among several other symptoms, and these other symptoms have all been cured, I have called the case cured.

Information as to relief of individual symptoms has been difficult to obtain, but the following are noted:—

Cases.	Symptom complained of.	Relief obtained in—
25	Menorrhagia	11
21	Dysmenorrhœa	16
41	Constant pain	27
18	Sterility	4
3	Dyspareunia	1

Of the 10 cases who were "cured," complications were present in 8 cases at operation—i.e., 80 per cent. In 26 cases who were only relieved, complications were present in 21, or approximately 80 per cent.; while in the 14 cases who remained in statu quo only 71 per cent. had complications.

Position of Uterus.—In the 27 cases who reported for examination the uterus was found anteverted in 22 cases, of whom 12, or 55 per cent., were relieved, and retroverted in 5 cases, of whom 3, or 60 per cent., were relieved.

Pregnancy had occurred in 8 of the 50 cases, of whom 1 was pregnant at the time of investigation and 2 had had miscarriages only. Of these 8 cases, 6 expressed themselves relieved, while of 4 cases who presented themselves for examination, the uterus was found anteverted in all.

In comparing these results with those of other authors, the difficulty previously alluded to arises—namely, that practically all either include cases of prolapse or leave one in doubt as to whether prolapse is included or not.

In 1899 Alexander [4] published a list of 69 cases operated on by his method of external shortening of the round ligament. In practically all cases a pessary, either a Hodge or a Hodge and stem, was inserted at the time of operation, and nine cases required operation for prolapse. He reports on cases at intervals from six months up to ten years after operation and finds the uterus in good position in 46 cases and the symptoms relieved or cured in 36 cases. Pregnancies had followed in 18 cases, of whom 13 remained well, and among whom the uterus was found anteverted in all but 3 cases. A series of cases published by A. Goldspohn[5] is also interesting; of 127 cases treated by a modified Gilliam operation (perineal operations were also required in 23·5 per cent. of cases) health and position of uterus remained good in 88 per cent. of cases. In 1·6 per cent. of cases there was a recurrence of displacement.

Comparing the above series of results with those obtained by pessary treatment I note that F. W. Lynch [6] in a series of 281 cases found a pessary useless in 47 (a pessary could not be retained in 32 cases), but in the remainder obtained a 72 per cent. cure. These results appear much more satisfactory than those recorded in my series, but I recapitulate that I consider this due to the inclusion in their series of well-marked cases of prolapse.

Conclusion and Summary.

1. Cases of retroversion complicating prolapse should be treated as cases of prolapse. Abdominal operation alone rarely, if ever, cures these cases, and their inclusion in statistics of operations for retroversion leads to confusion.

2. Retroversion is not a disease in itself and never, with the possible exception of the "Bonney syndrome," gives rise to a definite train of symptoms. It is usually complicated by other pathological findings; and it is these, as a rule, which indicate operative treatment, and upon which relief of symptoms largely depends. In this series, 80 per cent. of "cure" cases were complicated, while only 70 per cent. of cases unrelieved had complications. Possibly a longer series might show a more marked difference between these two. In cases where no complication is found on clinical examination, and sterility is complained of, operation is sometimes indicated, as closed tubes may be present and a better chance of conception seems to be given after dilatation of the cervix, if the uterus is replaced and retained in the anteverted position.

3. In many cases an undoubted nervous element is present, the significance of which must be carefully assessed before operative treatment is undertaken, and in considering the result of such treatment.

4. Too few cases of pregnancy have occurred in my own series to enable one to make any statement as to its effect, but from a consideration of the results given by other authors, pregnancy does not seem to exert any deleterious effect on orthopædic and clinical results of treatment beyond the fact that it makes prolapsus more common and may, if symptoms recur, transfer the case to one of the first category mentioned in this paper.

All cases mentioned in this paper were patients at the Hospital for Women, Soho-square, and I desire to express my thanks to members of the honorary staff for allowing me to make use of notes, &c.

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PEOPLE'S LEAGUE OF HEALTH.—The next course of the Sims Woodhead series of ten weekly lectures, followed by an examination (not compulsory), and Travelling Scholarship Prize awards, will be given at the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., beginning on Feb. 11th, at 6 P.M. The lectures will be delivered by Dr. H. A. Harris, Prof. M. S. Pembrey, Sir Frederick Mott, F.R.S., Sir Harry Baldwin, Prof. J. C. Drummond, Dr. J. Mellanby, Sir William Arbuthnot Lane, Prof. H. R. Kenwood, Mr. E. B. Turner, and Dr. A. F. Tredgold. Further particulars may be obtained from the hon. organiser of the League, 12, Stratford-place, London, W. 1.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF COMPARATIVE MEDICINE.

DISEASES OF NUTRITION IN ANIMALS.

A MEETING of this section was held on Jan. 23rd, Sir LEONARD ROGERS presiding.

Prof. E. MELLANBY pointed out that in recent years our views on nutrition had greatly changed. It was now known that substances formerly regarded as physiological units had great biological differences—for example, different proteins, and, moreover, dietetics had been altered by the discovery of vitamins. The deficiency diseases—scurvy, beri-beri, and rickets—could all occur in the animal as well as in the human world. Scurvy had been described in hogs and occasionally in dogs. Veterinary text-books consulted by Prof. Mellanby recommended the addition of grain, acorns, and horse-chestnuts to the diet of hogs thus affected; these substances were not strongly antiscorbutic. Beri-beri was sometimes to be seen in domestic animals, such as birds, and was easily cured. He intended to discuss chiefly the conditions which in animals tend to produce good and bad bones. Actual rickets did not indeed often appear spontaneously in animals except dogs, but while bone changes might not be produced, the lowered vitality and changes in muscle resulting from bad feeding might well be of economic importance in other animals. There were some grounds for assuming that the results of his experimental work, which had been done on dogs, might apply to other animals, even herbivorous ones, in that green food, such as lucerne and clover, here supplied the necessary accessory factor.

The Toxic Effect of Cereals.

One of the commonest dietetic mistakes was to feed animals with cereals—for example, oats or bran. Prof. Mellanby demonstrated slides showing that dogs fed on a diet deficient in vitamin A, leading to rickets, got worse when fed on cereals, white flour being least toxic, and next in order being rice and rye; oatmeal and wheat-germ were specially liable to intensify the rickety condition. The toxic factor could be associated neither with the calcium-phosphorus ratio in the foodstuff, the salt content, the carbohydrate present, nor the nucleic acid; its nature was still undiscovered, and it could only be said at this stage that something in cereals was toxic and interfered with the process of calcification. The antagonists to this unknown factor included (1) calcium (carbonate being better than phosphate); (2) ultra-violet light when the diet was not excessibly deficient; (3) cod-liver oil, of which $\frac{3}{5}\frac{1}{2}$ daily counteracted the detrimental effect even of oatmeal. Prof. Mellanby showed slides not only of bone but of teeth and of muscle, to show the damage that could be done by a cereal diet. The first result of such a diet was lethargy, which might go on to paralysis; it was easy to produce any intermediate stage by varying the diet. He suggested that in animals put out to graze the rest was not so important in their cure as the plentiful green pasture available. Incidentally the diet generally given to racehorses in training was puzzling, as on theoretical grounds it seemed unlikely to produce fast runners.

Whether his results applied to animals other than dogs Prof. Mellanby could not state definitely, but the evidence that they did apply to children was convincing. The points that required emphasis from the veterinary standpoint were: (1) That the foodstuffs in general use had a toxic effect; this was no reason for not using them, but the fact should be realised and antagonists suitable for different animals—lucerne, cabbage, milk, fish fats—should be added. (2) That calcium carbonate was a serviceable antagonist. (3) That freedom in fields, which implied greenstuffs and sunlight, was of benefit. Animals kept in confinement and fed on oats or oatmeal or wheat-germ were in some danger. Progressive agriculturists who gave their stock wheat-germ because it contained vitamin B and some vitamin A must remember that it contained also something of a toxic nature.

The Development of the Science of Dietetics.

Miss HARRIETTE CHICK, D.Sc., traced the history of the newer dietetics during the last ten years, showing how the parallel between polyneuritis of birds and beri-beri, and that between scurvy in guinea-pigs and in humans, and rickets in dogs and in humans, pointed to the conclusion that many of the results of experimental work did apply to the whole race of mammals and sometimes to birds also. Work done piecemeal at different places and times appeared to be coalescing slowly into a coherent intelligible whole. Quite recently American investigations on poultry had shown that on a diet deficient in vitamin A, leg weakness and a diseased condition of the eye similar to that seen in the rat and rarely in infants occurred in fowls, and the interaction of light and diet, proved on children in Vienna, had also found a complete parallel in these animals. The only animal which still appeared anomalous in this respect was the pig, but Miss Chick expressed the hope that ultimately even the pig would be brought to heel! As an instance of a striking anomaly that had been explained by further research, Miss Chick recalled the disconcerting failure to cure guinea-pigs of scurvy with lime-juice, and its explanation by the history of the change of nomenclature of lime-juice and lemon-juice.

The Veterinary Point of View.

Mr. HENRY GRAY said that no practical man would ever think of feeding dogs on the food Prof. Mellanby had used in these experiments. Rickets could be induced in dogs, especially in large breeds, if they were kept on a chain and given no exercise. Practical agriculturists fed their animals on the food produced on farms, guided by tradition handed down and modified by their own experience. Osteomalacia could occur in animals exposed to sun and given green food; it appeared sometimes to be dependent on the change of food natural to a special race. For example, horses accompanying the French army to Cochin China developed osteomalacia, and fodder had to be imported for them from Europe and Algeria. He considered heredity to be a factor in bone disease, and also overwork. He had seen rickets develop in dogs kept without exercise in sunlight, and had seen horses in good condition after 20 years in coal-mines. Certain breeds of toy spaniels were liable to mal-development of bone, also bulldogs, in which teeth were sometimes set in cartilage; this seemed to be a heredity defect. Lack of muscular power in shire horses was the result of over-forcing and lack of exercise. Mr. Gray concluded, after studying Prof. Mellanby's interesting conclusions, that "his theory was not applicable to our practice."

Polyneuritis and Beri-beri.

Colonel R. MCCARRISON wished to dissent from the general impression that polyneuritis of birds was identical with beri-beri. In man suffering from beri-beri cardiac enlargement was a prominent feature, while in experimental birds with polyneuritis atrophy of the heart was found. He had produced polyneuritis some 2000 times, and not until among the last 200 pigeons had he met with true beri-beri—with enlarged heart, pericarditis, and so forth. This batch of pigeons came from Bangalore, and five or six out of the 200 were affected. As regards beri-beri in man, in 1917 two battalions of the same regiment were quartered at Quetta and fed from different sources. Of the 800 fed on rice 3·5 per cent. developed beri-beri—approximately the same percentage as of the pigeons. Colonel McCarrison expressed his conviction that something more than the absence of vitamin B was necessary for the production of true beri-beri in birds—some factor with a

specific action on the heart. In India, where rice was cultivated everywhere, of the 595 cases occurring in the Indian army between 1900 and 1914, 500 occurred in an area in the north-east, where beri-beri is endemic. It would seem that residence in a certain locality imparts some stigma to individuals which makes them more liable to succumb to bad dietary conditions. With regard to muscle, if the changes shown by Prof. Mellanby in skeletal muscle took place, muscles of gastro-intestinal tract were probably even more affected by deficient diets and faulty feeding might well account for the large amount of chronic gastro-intestinal disease now so common. As to the importance of faulty feeding in resistance to infection, Colonel McCarrison quoted his experiments on monkey carriers of *Entamœba histolytica*—those only who were badly fed developing dysentery.

Prof. G. H. WOOLDRIDGE pointed out that in animal dietetics the economic aspect often overshadowed the medical one, even in standard text-books. He emphasised the need of balance as well as vitamins in food. Affections allied to rickets occurring later in life had been studied. Sir Arnold Theiler in South Africa showed that cattle with depraved appetites who ate bones of carcasses left on the veldt acquired a bone disease; this was partly due to infection by bacteria, since when these bones were sterilised and the animals induced to eat them no bad effects resulted.

Dr. M. J. ROWLANDS confirmed Prof. Mellanby's remarks as to the toxic effect of wheat-germ from practical experience. On theoretical grounds he had tried to feed pigs with wheat-germ as a source of vitamins A and B; 20 large white sows had been given wheat-germ, supplemented by meat and fat; all had developed violent diarrhœa. Ten had been put on middlings and recovered, and the 10 controls left on the old diet had died. He agreed with Mr. Gray that the diet used by Prof. Mellanby was unsuitable for ordinary dogs, but of the importance of the effect of vitamins on animal nutrition he was convinced by the happy practical results of their administration.

Captain KIRK asked whether the question of disturbed internal secretions as a factor in rickets had been considered by Prof. Mellanby. He asked whether any light could be thrown on the fact that if the rations of hard-working horses were not reduced during a period of rest they were liable to develop acetonuria.

Dr. F. W. COLLINGWOOD said that pigs had been reared successfully on nothing but swedes, with no meat at all.

Prof. F. HOBDAY confirmed the fact that osteomalacia appeared to be endemic. In veterinary experience crude cod-liver oil seemed to give better results than the purified form, and calcium lactate appeared to be the most useful form for administering calcium.

Captain F. C. GILLARD suggested bowel parasites as a contributory factor in rickets.

Dr. J. S. EDKINS pointed out that cats were specially liable to parasites, but did not suffer from rickets.

Reply.

Prof. MELLANBY, in reply, explained that theories such as those of hormones and bowel parasites as factors in rickets appeared to be merely hypotheses with no evidence to support them, whereas experimental evidence, though it might not be conclusive, represented at least an attempt to pick out the more important factors in the production of this disease.

SECTION OF PATHOLOGY.

A MEETING of this section was held on Jan. 15th, Prof. J. G. LEDINGHAM, F.R.S., the President, being in the chair.

Dr. J. KILIAN CLARKE contributed a paper on the

Bacteriology of Dental Caries.

He said that all the very meagre evidence at our disposal tended to support Miller's theory that dental caries is due to bacterial fermentation of carbohydrates with production of acid which decalcifies the teeth. Of late considerable attention had been directed to the acidophile group of bacilli in this connexion; the members of this group were active producers of acid, in a high concentration of which they could live—in fact, they grew best in a medium of a comparatively high acidity. McIntosh, James, and Lazarus-Barlow isolated acidophile bacilli from 44 out of 50 carious teeth examined by them, and produced lesions resembling caries in healthy teeth placed in glucose broth cultures. The teeth examined by these observers and others were in a fairly late stage of caries, with cavity formation, and the conditions in these cases are very different from those which obtain at the initiation of the lesions. Dr. Clarke was unable to isolate acidophile bacilli from early cases in which there was little or no apparent loss of enamel substance, but found another organism constantly present; this organism does not appear to have been described previously, and he proposed the name *Streptococcus mutans* for it. *S. mutans* is a streptococcus on media of a neutral reaction, but grows as a bacillus if the reaction becomes acid. It is Gram-positive, aerobic, and facultatively anaerobic. The colonies are very coherent and difficult to pick up off the surface of the medium, as they run along in front of the needle. It is an active producer of acid, but is not acidophile, as it is quickly killed if the medium becomes acid, and refuses to grow on a medium with a reaction more acid than pH 5·6. All strains isolated are identical in fermentation and agglutination reactions. *S. mutans* was isolated from 36 out of a series of 50 teeth (in pure culture from eight), while in most of the negative cases colonies of the organism were seen, although it could not be isolated. The lesions in these teeth were, in the great majority of cases, very early. Acidophile bacilli were isolated only in the more advanced cases, where there was a break in the continuity of the enamel, or in cases in which the lesions were very shallow and the surface encroached on in taking the specimens. Attempts to produce artificial caries in healthy teeth, by placing them in cultures of *S. mutans*, were being made. The growth of the organism adhered markedly to the surface of the teeth and decalcification of the enamel took place with comparative rapidity. Decalcified sections of a tooth kept in cultures for nine and a half weeks were exhibited; they showed the organisms, which had penetrated the enamel, invading the dentinal tubules. The medium had been changed daily, so that the tooth did not remain for any length of time in an acid solution; in McIntosh, James, and Lazarus-Barlow's experiments the medium was changed only once a week. Although there was as yet no conclusive evidence to prove that *S. mutans* was the cause of caries, the facts that it was found regularly in early cases, sometimes in pure culture, grew best at a reaction approximating that of the saliva, adhered to the surface of the enamel, and could produce lesions in vitro similar to those of caries, were, to say the least, suggestive.

Mr. ROBERT T. GUNTHER demonstrated a case of

Arterio-sclerosis in a Crocodile of the Mesozoic Age.

He exhibited vertebræ of fossil crocodiles from the mesozoic strata of Oxfordshire which showed coloured Y-shaped markings following the course of segmentally arranged intercostal arteries and veins. The suggestion receives confirmation from the subsequent finding of such arteries in a recent crocodile and from the discovery of lateral grooving of similar vertebræ in a crocodile from an older geological stratum. That the imprints of these arteries, whether in colour or as grooves, had not been previously observed, is due to the great scarcity of specimens exhibiting them, and as by far the greater number of crocodilian vertebræ did not show them Mr. Gunther is inclined to regard them as pathological, and possibly as indicating an early stage of arterio-sclerosis.

Mr. ALEXANDER FLEMING read a paper on

Accuracy of Measurements with Capillary Pipettes.

He described the various types of error which might occur and showed that when the "wash,"

that is, the fluid which remains adherent to the pipette, is eliminated a volume of fluid as small as 5 c.mm. can be measured from a capillary pipette with great accuracy. The "wash," which is the greatest error in measurement with capillary pipettes graduated in the ordinary way with a measured volume of mercury, is almost constant when the fluid is expelled from the tube at anything approaching the same rate of speed, and with pipettes such as are in common use it amounts to about 3 per cent. of the total volume. The "wash" provides a progressive error in making a series of two-fold dilutions such that at the eighth dilution the error will amount to about 13 per cent. The author described a pipette graduated in such a manner that a series of dilutions in arithmetical or geometrical progression could rapidly be made with accuracy and the error due to the "wash" eliminated.

SECTION OF OPHTHALMOLOGY.

A MEETING of this section was held on Jan. 11th under the presidency of Mr. A. L. WHITEHEAD.

Lieut.-Colonel H. HERBERT read a paper on a case of

Late Chronic Sympathetic Ophthalmia.

He said the disease followed a trephining operation, performed without iridectomy, for congestive glaucoma, in November, 1917, when the patient was 62 years of age. More than five years elapsed before the other eye became involved. The operation did not entirely relieve the tension, and the congestion persisted for more than a month. After that it gave no more trouble until the fellow eye was attacked, and then injection and tenderness returned. In the sympathising eye the disease was comparatively mild, and seemed to yield completely to three months of simple mercurial treatment. In this case there was ample histological evidence that the operated eye, during the five quiet years, was only relatively quiet. The notes mentioned only a dense white pupillary opacity and the fact that the eye was blind. There was good reason for believing the eye was the seat of a very feebly progressive infective process throughout. The nodular character of the uveitis was very noticeable, the foci of greatest infiltration standing out as round white points in the iris, ciliary body, and choroid. Colonel Herbert described the cytology by means of a number of slides. As a probable indication that the unknown specific organism had become acclimatised outside the uvea, large-celled infiltration could be followed through the tissues filling the trephine hole and through the sclera, along the anterior perforating blood-vessels above and below the cornea. It had spread into the conjunctiva, and backwards immediately superficial to the sclera. There was another extra-uveal site of activity beneath the thick pupillary membrane noticed clinically between the membrane and a thick capsular cataract. The detached retina was folded and thickened, and the ciliary body and choroid were more or less detached from the sclera, and their layers were widely separated. The inner surface of the choroid below merged into a thick layer of new fibrous tissue, containing masses of pigment granules, derived possibly from the retinal pigment layer; pigment had also wandered into the detached retina.

With regard to the bearing of the case on the operative treatment of glaucoma, he had not heard of any instance of the disease following an intentional iris-inclusion operation for over 20 years, and he believed a correctly performed iris-inclusion operation was quite free from this risk: but he held that correct performance included effective conjunctival antisepsis. In the present case the trouble was probably due to the lack of this.

Discussion.

The PRESIDENT said that most of those who habitually did the trephine operation would join issue with Colonel Herbert's contention that in most cases there was incarceration of the iris.

Mr. R. PICKARD spoke of a case he had three years ago which might have been one of sympathetic infiltration after trephining. The operated eye did not do well, and about six weeks later keratitis punctata developed in the fellow eye. He promptly removed the first eye, and the other recovered. He had had two or three cases of chronic glaucoma affecting both eyes, in which suddenly, for no apparent reason, one eye developed severe irido-cyclitis, leading to blindness. It looked very much like sympathetic ophthalmia. He thought that in some cases chronic glaucoma was the expression of some very mild cyclitis without the ordinary symptoms of cyclitis. Yet it might be seen when there had been no operation on the other eye.

Sir WILLIAM LISTER said that in doing the trephining operation it was very important to see that no iris whatever was incarcerated. He believed that the cases of late infection which had occurred were those associated with some entanglement of iris in the wound. This avoidance of incarceration of iris should be aimed at by three procedures. Directly the knuckle of iris appeared through the trephine hole, the posterior portion should be pulled up so as to do irido-dialysis, and pull out sufficient iris, so that when the iris was cut it spread away from the opening. Where there was a large pupil one should aim at doing a complete iridectomy right through to the pupillary margin.

Mr. R. A. GREEVES said that sometimes the trephine was put on too far back, resulting in incarceration of the iris. He had cut sections of a series of eyes which had been trephined and were failures, in each case because of iris incarceration, and in all of them he considered the trephine had been put too far back and the cornea had not been split far enough forward.

Mr. R. L. REA spoke of a case in which he had to trephine two eyes in an urgent case of glaucoma. In one case the iris became incarcerated round the edge of the trephine hole and he could not free it. Therefore as soon as the flap was replaced he put atropine in the eye, and kept it under the influence of that drug. It drained very well, and he saw the iris pull away completely in a fortnight. The eye had now done well, and vision was restored to 6/9 partly.

The PRESIDENT agreed with Sir William Lister as to the importance of securing freedom of the iris from the wound. He would do complete iridectomy rather than leave the slightest trace of iris in the trephine opening.

Colonel HERBERT, in reply, agreed that the small incarceration of iris had a good deal to do with the disease in this case. There was no doubt in his mind that it was a case of sympathetic ophthalmia. The histology was characteristic: there was nodular uveitis, and it was different from the tuberculous or syphilitic case.

Mr. T. HARRISON BUTLER read a paper on the

Practical Value of the Slit-Lamp,

and demonstrated the lamp. He said many still had the idea that the slit-lamp was useful chiefly for research, but such was not the case. It enabled problems connected with the ocular fundus and the media to be studied afresh, not only by greatly increased magnification, but by permitting the illumination of structures from behind, and enabling the anatomy of the eye to be seen in optical section By means of a 40-candle half-watt gas-filled lamp a ray of light could be directed into the eye and the cornea could be seen to be illuminated, the anterior chamber dark, and in lens sclerosis there were seen in the lens dissociation areas. By lens light one could see holes and atrophic areas in the iris collarette. Also, the circulation in the vessels at the limbus in the normal eye could be seen. During the four months he had worked with the lamp, he had learned much about the anatomy and pathology of the exterior segment of the eye. The examination must be made in complete darkness, and the more difficult

objects could be seen only when the eye was dark-adapted. The examination of patients with the lamp caused them little or no discomfort. Cases of interstitial keratitis were unsuitable for examination by this means. The slit-lamp did not supersede present methods, but amplified and supplemented them. The depth to which foreign bodies had penetrated the cornea could be correctly estimated by using the lamp, and means for removal could be taken accordingly. It was of especial value in inflammatory conditions of the cornea. Deposits of cells on the endothelium in keratitis punctata could be detected when the particles were too small to be seen with the naked eye. A case of interstitial keratitis could not be completely interpreted without the slit-lamp. Observation of the aqueous was very difficult, and called for complete dark adaptation. The presence of cells in the aqueous was the first sign of irido-cyclitis, and was especially valuable in the case of a sympathising eye; such cells when seen could be regarded as an early warning of the onset of sympathetic ophthalmitis. The slit-lamp was of most service in examining the lens. The optical section given by the narrow ribbon of light enabled the lens to be seen in profile. Vogt had differentiated as lens regions the capsule, the cortex, the senile nucleus, and the embryonic nucleus. Clinically, the lens could be regarded as three lenses, one within the other, and these gave mirror effects to focal illumination. In a case of diabetic cataract Mr. Butler noted that the lens capsule was greatly thickened, and in such a case, if it came to operation, he would use capsule forceps in preference to a capsulotome. He showed four photographs illustrating a case of combined cortical cataract and nuclear sclerosis. Examination of the lens in mirror light showed that the whole surface was covered with nipple-like eminences. One of the chief uses of the slit-lamp was the power it gave to recognise slight signs of cyclitis. The chief drawback to its use was the extra time required for examination, some 50 per cent. longer than for the older method. The new means of examination was so important and specialised that the formation of a small society of slit-lamp enthusiasts was justifiable, to meet and discuss cases and problems and for mutual education.

Mr. BASIL GRAVES spoke of the many clinical features which were revealed by the slit-lamp, and the fact that it enabled the observer to detect prodromal manifestations of sympathising ophthalmitis at a far earlier stage than had been possible before its introduction. An apparently normal senile eye stood revealed by this instrument as a veritable museum; and its use in the case of patients known to be suffering from some regional affection was very fruitful of results. It was a remarkable instrument for conducting research into eye conditions, and he mentioned a number of respects in which this was the case, and the precautions which needed to be observed. But it should only bear its due and proportional share in the scheme of routine clinical examination.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

Exhibition of Cases and Specimens.

A MEETING of this section was held on Jan 25th, with Mr. R. H. ANGLIN WHITELOCK, the President, in the chair.

Dr. GEOFFREY EVANS showed a case of

Interstitial Nephritis Simulating Diabetes Insipidus

in a girl aged 13. The child's health had been good until four years ago, when thirst, polyuria, and loss of weight began. On account of these symptoms a diagnosis of diabetes insipidus had been made at two general hospitals, but the diagnosis of interstitial nephritis was established after her admission to St. Bartholomew's Hospital by the low specific gravity of the urine and the presence in it of red and white blood cells and a trace of albumin, and by the deficient urea secretion and the high blood-urea content. Cases of interstitial nephritis in children were of two types: (1) where the renal condition was a part of a diffuse hyperplastic sclerosis; and (2) where the only changes were in the kidneys. He thought this case was of the latter type and probably had a congenital kidney defect (possibly only one kidney).

Dr. C. WORSTER-DROUGHT exhibited a case of

Juvenile Tabes Dorsalis

in a girl of 10 years, with a case of Friedreich's ataxy for comparison. Tabes dorsalis was very rare in childhood. In 1903 Marburg collected the records of 34 cases but some of these were doubtful, as the difference between this disease and Friedreich's ataxy was not always appreciated by the earlier observers. In the juvenile form of tabes the pupillary signs were the first to appear and might be followed by optic atrophy; lightning pains and visceral crises were less common than in the adult form, and ataxy was absent as in the case shown. Again, juvenile tabes was commoner in the female sex. On the other hand, Friedreich's ataxy was marked by an absence of pupillary signs and the presence of ataxy; loss of the knee- and ankle-jerks was common to both diseases.

Mr. O. L. ADDISON showed a specimen of the spleen from a case of

Gaucher's Splenomegaly.

The spleen, which was removed under the impression that the child was suffering from splenic anæmia, was much enlarged and paler than normal and exhibited no capsular thickening. The glands at the hilum were enlarged; the viscus weighed 17 oz. and the weight of the child from whom it was removed was 19½ lb. The child recovered from the operation.—Dr. HAROLD PRITCHARD said the child was admitted to his wards during an attack of bronchitis. Systematic examination revealed enlargement of the liver, very great enlargement of the spleen as far as the umbilicus, and no enlargement of lymphatic glands. There was anæmia of the chlorotic type and leucopenia with a relative leucocytosis. The Wassermann reaction was negative. The true nature of the disease was only revealed by the microscopic examination of the excised spleen which showed the typical Gaucher's cells. Since the operation the child had appeared more contented; previously it had been very fretful. Gaucher's splenomegaly was apparently a very rare disease as he (Dr. Pritchard) had only been able to find 23 cases recorded in the literature.

Dr. PARKES WEBER said it was clear that Gaucher's disease was one of the whole reticulo-endothelial system and affected the endothelial cells of the liver and bone-marrow as well as those of the spleen. These cells were distended with a lipoid substance. Dr. McNee had demonstrated to him in sections of this spleen, which was an excellent example, that the bright lipoid substance was not doubly refracting and hence it could not be, as had been supposed, a cholesterin ester. The disease was evidently an inborn error of metabolism resembling alkaptonuria, hence its familiar occurrence.—Dr. J. W. MCNEE thought that Gaucher's disease was not so rare as had been supposed, for he had seen three cases in this country since the war. This specimen showed the lipoid in the cells better than any other he had seen. While the nature of the lipoid remained unknown it seemed in many ways to resemble the substance found in amyloid disease. Dr. A. K. GORDON pointed out that the characteristics of Gaucher's cells were not made visible by the methods ordinarily employed for staining sections. If frozen sections were stained with Giemsa's stain every stage in the formation of the Gaucher's cell from the lymphoidocyte could be observed.—Dr. F. J. POYNTON inquired whether the diagnosis of Gaucher's disease could be made during life and whether the operation of splenectomy was likely to improve the prognosis.—In reply, Mr. ADDISON said that in recorded cases splenectomy had not influenced the course of the

disease, and Dr. H. PRITCHARD added that the disease had on occasion been diagnosed by splenic puncture.

Mr. B. WHITCHURCH HOWELL and Dr. W. L. KINNEAR showed a case of

Fragilitas Ossium with Blue Sclerotics.

The patient was a girl, aged 3½, who had already suffered six fractures. The mother, who also exhibited blue sclerotics, had had fractures of the clavicle, wrist, radius and ulna, and humerus. The case was shown with a view to obtaining suggestions as to treatment. Dr. Kinnear said that there were only two cases of fragilitas ossium in the family and (in reply to Dr. Parkes Weber) that there was no family history of deafness. On an analogy with rickets he intended to try the mercury quartz-lamp treatment and possibly parathyroid medication.—Dr. A. FEILING considered that the disease was a general one and pointed out that the liability to fractures persisted after puberty. No treatment was known to avail.—Dr. HELEN MACKAY thought that the mercury vapour lamp was unlikely to be beneficial since its effect in rickets was that of cod-liver oil, which was known to have no effect in fragilitas ossium.—Dr. ERIC PRITCHARD had seen a case of multiple fractures do well with cod-liver oil and the mercury lamp treatment.

Dr. ERIC PRITCHARD showed a case of

Anæmia in a Premature Infant treated by Intraperitoneal Injection of Blood.

The technique of the injection was quite simple; the abdominal wall was either punctured with a blunt needle which would not injure the gut or a sharp needle was used to transfix a "pinched-up" fold of the abdominal wall.—Dr. IZOD BENNETT asked whether there was any evidence that red blood cells injected into the abdominal cavity reached the circulation, and Dr. GORDON pointed out that the result of injecting blood into the peritoneum was to produce an extravasation of phagocytes which rapidly ate up the red blood cells. He suggested that the child was suffering from some infection and that the benefit it had obtained, apparently from the injection of blood, was in reality due to the peritoneal reaction produced.—In reply, Dr. PRITCHARD admitted that it was difficult to see how the red blood cells gained access to the circulation.

Dr. W. E. HILLS showed

A Child in whom the Sex has not yet been Determined.

The PRESIDENT thought the child a boy, who exhibited an extreme degree of hypospadias.—Dr. POYNTON discussed two similar cases he had seen, and Dr. DONALD PATERSON said that cases which had been "opened" to determine the sex almost invariably proved to be males.

Dr. IZOD BENNETT showed a girl who exhibited

Choreiform Movements Persisting for Four Years.

The movements began after an attack of somnolence lasting 24 hours, and were treated initially with ice-packs with the result that the movements disappeared and a flaccid paralysis occurred which lasted two months. After a short interval, during which the child appeared normal, the movements returned. He had regarded the case as probably one of encephalitis lethargica, but one member had suggested that the movements were functional and might be cured by suggestion.—Dr. E. PRITCHARD and Dr. A. W. CARR agreed with Dr. Bennett's original diagnosis.

Other Cases.

Dr. R. C. JEWESBURY showed a case probably of retroperitoneal sarcoma in an infant with a swelling of the left side of the back which had grown visibly since December, 1923.

Dr. ERIC PRITCHARD showed a case of chronic interstitial nephritis in a child aged 8 months. Originally the child had been sent to Mr. Tyrrell Gray and Dr. D. Paterson as a case of vomiting thought to be due to congenital hypertrophic stenosis of the pylorus, but the true nature of the case was revealed by the low urinary urea output and the high urea content of the blood.

Mr. WHITCHURCH HOWELL showed a case exhibiting a local atrophy of muscle and subcutaneous fat affecting chiefly the right lower extremity. The child exhibited was the second child of first-cousins; the elder child exhibited no abnormality beyond slight albinism.—The case was discussed by Dr. PARKES WEBER, who pointed out the fibrous nodules over the shin. A number of similar cases where the upper limb was affected had recently been described and labelled "lipodystrophia progressiva" of the superior type.

Dr. BERNARD MYERS read a paper on methods of collecting records of sick children, and described a method of collecting statistics which had already been put into operation.

LIVERPOOL MEDICAL INSTITUTION.

A MEETING of this institution was held recently, Prof. J. HILL ABRAM, the President, being in the chair.

Dr. D. R. OWEN read a note on a case of

Abdominal Aneurysm.

Aneurysm of the abdominal aorta had occurred, he said, in a man previously in good health. A week after an attack of pain in the back diagnosed as lumbago he was sent into hospital with shock, distension of the abdomen, and tenderness, but there was no rigidity and no vomiting. At first it was thought there was a tumour in the region of the sigmoid and pancreatic disease was considered, although there was no glycosuria. The attack of pain subsided and an expansile tumour of the abdominal aorta was then clearly felt. One day later, and three days after the acute attack, the patient had another acute attack, collapsed, and died. Autopsy showed clots of varying duration in a retroperitoneal collection of blood from a rupture of a diffuse aneurysm about two inches above the iliac bifurcation. There was extensive ulceration and calcification of the aorta, and the leaking of the aneurysm probably accounted for the attacks of pain. The first acute pain occurred whilst lifting a weight when at work, and gave the case a forensic as well as a clinical interest, in that when admitted the case resembled an acute abdomen. The only treatment given was the intramuscular injection of saline containing horse serum, and the general treatment of shock.

Dr. ROBERT COOPE read a short paper on

Some Points in the Diagnosis of Pancreatic Disease.

After dealing with the difficulties of diagnosis he discussed briefly the acute and subacute lesions of the pancreas and their clinical features. Concentrating more particularly upon chronic disease of the gland, for example, scleroses of various types, and cancer, he mentioned certain helpful points in diagnosis which could be drawn from a consideration of its anatomical situation, its physiological functions, and the association in certain cases of similar trouble in the liver. The clinical picture of chronic pancreatic trouble was then discussed and a critical review was made of the various tests of pancreatic function. In Dr. Coope's experience it was rare in chronic pancreatic disease to get a marked excess of neutral fat in the fæces. In cases with excess of fat this was usually present as split fat and associated with blockage of the bile-duct. Loewi's adrenalin mydriasis test was unsatisfactory, as it was sometimes misleading in cases of gall-stones without any obvious pancreatic involvement. The diastase content of the blood and urine was usually normal or low, and therefore of little help. A helpful and simple finding was the presence in the fæces, under certain strictly controlled conditions, of marked striation of all the muscle fibres seen under the microscope. It was probably the putrefaction of this undigested muscle fibre which gave the intense

indoxyluria seen in many of these cases. Glycosuria was comparatively rare, a finding not surprising in view of the pathology of conditions causing blockage of the duct. Dr. Coope had had no experience of the examination of the ferments obtained by duodenal intubation, but mentioned Carnot's results, and his view that lipase is the most satisfactory ferment to examine from the point of view of diagnosis of pancreatic insufficiency.

Dr. H. S. PEMBERTON submitted some observations on the

Action and Therapeutic Value of Insulin.

After an account of its properties the in vitro action of insulin on glucose was discussed. Five theories of activity in the living organism were considered, stress being laid on the glycogen-forming view, in favour of which experimental work by Dr. L. Cunningham and the speaker in frogs on galactose curves in the blood and on the differences in glucose content of arterial and venous blood in normal and diabetic conditions was described. The paper concluded with some pessimism as to the permanency of betterment in the diabetic as a result of insulin exhibition, but with acknowledgment of the advance which insulin had caused in the study of carbohydrate metabolism.

Dr. A. G. GULLAN stated that he had found insulin with restricted diet very effective in cases of severe liabetes in young adults. Several of these cases had 'he insulin gradually reduced and were now sugar free for a considerable time after insulin was stopped, but of course their diet was a restricted one. He also mentioned an interesting case in an older man where chronic pancreatitis had been noted by a surgeon when performing an operation for infective cholecystitis; the patient had later developed diabetes, and had done extremely well with treatment by insulin when other methods of treatment had not been satisfactory.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF STATE MEDICINE.

Discussion on the Diploma of Public Health.

A MEETING of this section was held in the Royal College of Physicians of Ireland on Jan. 11th.

Dr. N. M. FALKINER read his presidential address, in the course of which he reminded the meeting that the first paper read before the section was by Dr. Thomas W. Grimshaw, Registrar-General, on Feb. 9th, 1883, under the presidency of Sir Charles Cameron, and that of the original council Sir John Moore still survived. In due course many valuable papers had been contributed adumbrating the statutory enactments which were ultimately passed and showing that the profession in Ireland had performed its duty in forwarding legislation in public health during the past 40 years. The President went on to discuss the status of the Diploma in Public Health, reviewing the proceedings of the General Medical Council since the year 1869 in this regard. The University of Dublin had established a Diploma in State Medicine in the year 1870. The name of Prof. William Stokes was notably connected with this achievement. The President suggested that the subject should be discussed under the following headings: (1) uniformity in education and examinations; (2) uniformity in nomenclature of degree granted; (3) formation of a State public health service; (4) a combination between the Irish universities and colleges for instruction and examination in public health qualifications; (5) the status of preventive medicine in preliminary medical education.

Sir EDWARD COEY BIGGER mentioned some Acts of Parliament which had been passed in the years 1913 to 1920 in the interest of public health. These included Acts relating to the notification of tuberculosis, provision of meals for school-children, notification of births, venereal diseases, the Ministry of Health, and the enactments for the registration of nurses and midwives. He described the steps which led to the new regulations for the Diploma in Public Health in 1920. He had visited two universities to inspect some examinations for this degree and had found that the instruction in them for this examination was far from being uniform. Later, the new rules which were at present in force were started. He was of opinion that no medical officer would be as proficient as he should be unless he had some knowledge of clinical medicine. This would enable him to deal with the difficulties of a general practitioner in a more sympathetic way. When the course of study for the D.P.H. had been lengthened from nine to 12 months it was decided that the amount of time which had previously been spent on the study of practical chemistry was not necessary, although, of course, it gave the students a good scientific training. However, the chemistry course was shortened and the bacteriology course was lengthened. Some were of opinion that the rules in connexion with this examination were now too stringent, but he personally thought they were not. Some time later on it might become necessary to have a modified examination in connexion with the public services.

Sir JOHN MOORE said that the question of nomenclature for the qualification of D.P.H. was provided for by Act of Parliament. In this Act there were three names given for it—State medicine, public health, and sanitary science. On and after Jan. 1st, 1924, no candidate who had not begun to study for D.P.H. before that date could present himself for qualification under the old curriculum. The new rules regarding the examination had been rather hardly spoken of by many people. He personally thought that the study entailed under the new curriculum could not possibly be got through in less than 12 months. In the past a medical officer of health had frequently come into conflict with a medical practitioner, and he thought that it was most necessary that a medical officer should himself, before he took up that office, have been in practice, as this would enable him to sympathise with the medical practitioner, who sometimes might make a wrong diagnosis in the case of some acute infection. In some ways Sir John Moore was opposed to the new regulations. He regretted greatly that when these regulations were drawn up all consideration of public services—the Navy, the Army, and the Air Force—had been lost sight of. It was extremely difficult for men in any of these services to get leave for such time as was required for study under the new regulations. The strongest protest against the new regulations had been made by the Royal Colleges of England. The rules now in force also made it very difficult for doctors in the colonies to obtain the diploma.

Dr. THOMAS HENNESSY said that in Great Britain there was a dictator of public health services, but in Ireland there had never been such an official, and he thought this was a pity. In the Local Government Board the medical men had practically no power at all, and the laymen always counted for much more than did the medical men. He himself had often wondered what was the actual worth of the D.P.H. In Limerick recently there had been an election for a tuberculosis officer and there were three candidates, two of whom had the diploma. The position was given to the candidate who did not hold the diploma, and the other two were rejected.

Sir WILLIAM THOMPSON said that he thought the work of preventive medicine was becoming of more and more importance, and that in the future medical men would be able to accomplish more good by it than by any other means. The Act regarding the notification of tuberculosis was, in his opinion, not framed strongly enough. By this Act it was only necessary to notify two classes of tuberculosis: (1) surgical tuberculosis—cases in which there was a discharge and where the wound had to be dressed; (2) pulmonary tuberculosis in the last stage. He felt sure that every medical man would agree with him that, as regards the prevention of tuberculosis,

notification only of cases such as these was useless. Regarding infant mortality, he based his figures on the registration of births. For a number of years the infant mortality had been going down, and it was only during the last ten years that any Acts of Parliament had been brought in dealing with this matter; most of these Acts were voluntary, and not compulsory.

Dr. T. P. C. KIRKPATRICK said that the founding of the examination for D.P.H. in connexion with the College of Physicians was largely due to the work of Dr. Grimshaw, who was a very ardent supporter of public health. In March, 1882, he proposed that a Diploma in Public Health should be established, and in February, 1883, at his instigation the College of Physicians granted the D.P.H. after an examination.

Dr. J. C. O'FARRELL said he thought if the Section of State Medicine of the Royal Academy of Medicine in Ireland asserted itself more and brought itself into contact with the health authorities in Dublin that a great deal of good could be done regarding the health of the community. At present, for instance, houses were being built in which the rooms were absurdly small. These houses would accommodate large families and probably there would be six children sleeping in each room. Again, the supply of milk was unsatisfactory. Members of the Section of State Medicine of the Royal Academy of Medicine should make efforts to ensure that houses which were built had proper accommodation, that the rooms were sufficiently large, and also that a proper supply of good milk was obtained for the poor of Dublin. He believed that if the views of the section on these subjects were brought before the general public some good would result. He thought that to men in that country at any rate the D.P.H. was of very little use. Institutions for tuberculosis were governed and practically run by laymen, and the doctor, even if he had his D.P.H., was repulsed if he made any suggestions; he generally had no one to rely upon to back him up or to go to for advice. He thought if the health of the nation was to be improved the Section of State Medicine would have to assert themselves a great deal more and that the work which they did should be brought before the public and before the other authorities on public health.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Jan. 17th, Dr. G. M. DUNCAN, the President, being in the chair.

Mr. F. K. SMITH read a paper on

Gall-stones: a Review of 120 Surgical Cases.

Mr. Smith, assisted by Mr. Gordon Bruce, had studied the records of 120 cases operated upon for gall-stones in the wards with which he had been associated, and from the information obtained he was able to draw certain conclusions with regard to the results of recognised methods of surgical treatment, the dangers associated with operation, the main causes of mortality, and the frequence of recurrence of biliary trouble. In many of the cases, 19 of which were males and 101 females, symptoms had been present for 10 or 15 years, with the result that there was an impaired biliary and hepatic system with the usual signs, in addition, of old-standing systemic disease, so that the operative risk was very high. The cases were divided into two classes—acute (i.e., the acutely infected cases, not necessarily those with acute biliary colic) and chronic.

The majority of the acute cases, after having premonitory signs of biliary disease for years, became rapidly ill with the suddenness typical of the acute abdomen. Mr. Smith traced the usual course of events in such cases, and referred to cases of special interest in his series, such as acute hæmatogenous cholecystitis and progressive cholangitis. Most of the acute cases were treated by cholecystectomy, and out of a total of 32 operated upon the mortality was 11, being much greater among men than among women. Of those who survived, 18 replied to a letter of inquiry sent out more than two years after operation, and 15 expressed themselves as in very good health. From his review of the acute cases, Mr. Smith concluded that improved results could best be obtained not by devising new operative measures, but by improvement in technique, and by reducing the number of acute cases—i.e., by earlier diagnosis or by earlier operation. Mr. Smith then detailed symptoms and signs which might be produced by an acute infection of the gall-bladder, and briefly discussed the comparative merits of cholecystectomy and cholecystostomy in these cases, some points in the operative technique, the prevention of hæmorrhage in jaundiced cases, and post-operative care in general. In the whole series there were five cases of malignant disease.

In the group of chronic cases there were ten of chronic cholecystitis without calculi, and in these multiple abdominal lesions were the rule. Most of these were treated by cholecystectomy but the results were poor. Cases of calculi in the common duct numbered 23; jaundice was present in about half the number. Of chronic cholelithiasis there were 55; 27 were treated by cholecystectomy with two deaths, the end-results in the survivors being good, and 28 by cholecystostomy, also with two deaths. From a general survey of this group Mr. Smith concluded that in these cases cholecystectomy gave better results than cholecystostomy as regards both general condition and recurrence of gall-stone symptoms.

Discussion.

Dr. J. CRUICKSHANK mentioned various theories of the causation of gall-stones which he tabulated as (*a*) infection; (*b*) hypercholesterolæmia; (*c*) possibility of some disorder of metabolism—suggested by the association of usual age, sex, and general obese type of patient. He described some animal experiments now being undertaken by which ordinary small stones (gravel) were implanted into the gall-bladders of rabbits, but what this might produce was not yet definitely established.—Mentioning the greater frequency of occurrence of gall-stone cases, Prof. JOHN MARNOCH gave this only as an impression, though a very definite one, formed during his own career as a surgeon in the north-east of Scotland. He stated that during the past 20 years or so gall-bladder calculi cases had undoubtedly become much more common in proportion as cases of vesical calculi had declined in number. Had change of diet, he asked, anything to do with it?—This impression was corroborated by Dr. J. E. SKINNER, of Skene, from his experience in general practice. He also laid stress on the importance of early diagnosis and early investigation of suspected cases from the point of view of the possibility of metabolic disorder.—Dr. A. G. ANDERSON, Mr. G. H. COLT, Dr. J. D. WHITE (who discussed the X ray investigation required), Dr. ROSS MACKENZIE (who recommended gas and oxygen as the anæsthetic of choice for operation), and Mr. G. S. DAVIDSON also spoke.

DEVON AND EXETER MEDICO-CHIRURGICAL SOCIETY.—The annual meeting was held at the Royal Devon and Exeter Hospital on Jan. 24th, the retiring President, Dr. G. P. Hawker, being in the chair for the business portion of the meeting. The Council of the society, in presenting their annual report, mourned the loss of three original members, two of whom had died during 1923—Drs. G. T. Clapp and J. Delpratt Harris, and Mr. A. C. Roper. The following were elected as office-bearers for 1924: President, Dr. C. Vincent Smith; vice-president, Dr. E. J. Toye; hon. sec., Mr. R. Wayland Smith; reporting hon. sec., Dr. G. L. Thornton; hon. treasurer, Mr. A. L. Candler; hon. auditors, Drs. Bernard Kelly and Shirley Steele-Perkins; Council, Dr. R. V. Solly, Dr. Ransom Pickard, Dr. R. Eager, Mr. N. Lock, Dr. A. Hipwell, and Dr. Dobson Smythe. Drs. R. V. Solly and Ransom Pickard were elected hon. members as an appreciation of the long and valued services they had given to the society. Cases were then shown.

Reviews and Notices of Books.

OBSTETRICS AND GYNÆCOLOGY.

A Combined Text-book, by J. M. MUNRO KERR, M.D., F.R.F.P.S. Glasg., Professor of Obstetrics and Gynæcology, Glasgow University; JAMES HAIG FERGUSON, M.D., F.R.C.S. Edin., Gynæcologist, Royal Infirmary, Edinburgh; JAMES YOUNG, D.S.O., M.D., F.R.C.S. Edin., Assistant Physician, Royal Maternity Hospital, Edinburgh; and JAMES HENDRY, M.A., B.Sc., M.B., Senior Assistant to the Muirhead Professor, University of Glasgow. Edinburgh: E. and S. Livingstone. 1923. Pp. 1006. 35*s*.

THE first attempt to close the gap which exists between the art of midwifery and that of the treatment of diseases peculiar to women was made in the "Encyclopædia of Midwifery and Diseases of Women," edited by Dr. John S. Fairbairn in 1921, a monumental work of reference well adapted to the needs of the practitioner. In the present volume the same principle is adopted in the compilation of a text-book, which, as the authors note in the preface, is intended to impress the medical student with the fact that the great majority of ailments encountered in gynæcological practice are the result of infections and injuries contracted during parturition. With this statement few will disagree, but in a composite volume there may be some divergence of opinion as to the relative amount of space that should be devoted to each subject. In the present instance, the authors have given roughly three-fifths of the book to obstetrics and two-fifths to gynæcology. The volume is divided into ten parts. The first of these deals with anatomy and physiology and methods of examination, both in the non-pregnant and pregnant state. The next seven sections are devoted exclusively to the discussion of obstetric subjects. Gynæcology is relegated to the concluding two sections of the book, the first comprising chapters upon diseases of the female pelvic organs, including the bladder, rectum, and pelvic colon, and the last section including surgical technique and a description of various gynæcological operations.

However simple the principle may seem, the task of correlating two subjects, even so closely related as obstetrics and gynæcology, is no easy one, but this volume may be taken as a notable and praiseworthy attempt to deal with a difficult problem. Part I. attains the authors' object admirably, and we should like to see the same fusion in other sections of the book. The arbitrary wall between the two sciences still appears a little too high, and might be further broken down with advantage. For example, is it too much to hope that some day we shall see "displacements of the uterus and pelvic floor" considered primarily as a late obstetric complication? The same applies to certain chronic inflammatory conditions of the pelvic viscera still retained in the purely gynæcological chapters of the book. The connecting chapter between obstetrics and gynæcology might be developed in subsequent editions with considerable advantage, or, better still, a new "Part" introduced to include in a series of chapters all those diseases which are the result directly and indirectly of the pregnant state. The gynæcological sections would undoubtedly suffer, but the avowed aim of the authors to correlate more closely obstetrics and gynæcology would, we think, be still further attained. The subject-matter of the book is excellent, and there is an absence of debatable material which is commendable in a book designed for the student. The chapters dealing with obstetrics are particularly good, and the value of the text throughout is increased by the inclusion of a series of figures admirably reproduced, many of which have already done good service in Kerr's "Operative Midwifery and Clinical and Operative Gynæcology."

The book is a notable advance in teaching, and both student and practitioner will undoubtedly appreciate the advantage of possessing in one cover a symposium of modern views covering all that is necessary in the allied sciences.

ENDOCRINE DISEASES.

Including their Diagnosis and Treatment. By WILHELM FALTA, Professor of Medicine, Vienna. Translated and edited by MILTON K. MEYERS, M.D., Neurologist to the Northern Liberties Hospital, Philadelphia. London: J. and A. Churchill. 1923. With 104 illustrations. Pp. 669. 36*s*.

Dr. Meyers has brought out a third edition in English of Prof. Falta's well-known book on ductless glandular diseases. The title has, however, been altered to that of Endocrine Diseases since this name has now come into general use. In the ten years which have elapsed since Falta published the original work a great deal of new and important work has been done. The editor has endeavoured to add this to the latest edition and it is a great advantage to have this new work incorporated, especially since in each section it is so arranged that it can be read separately, while the original text can be followed easily. Where a statement of Falta's has been completely disproved the correction is made. The introductory chapter gives a general survey of the action of the ductless glands which is of great interest and has been brought up to date by the editor. In the next two chapters 120 pages are given up to the discussion of the thyroid gland and its diseases and make interesting reading. The newer work does not essentially alter Falta's views, though thyroxin, the active principle of the gland, has been isolated and prepared. Falta's objections to dysfunctions are supported by the editor, although he does not think that the question is finally settled. No mention is made of the observation that auricular fibrillation often occurs in severe cases. The diseases of the pituitary are very fully dealt with, although the reproductions of the skiagrams are not clear. The chapter on the pancreas is the least satisfactory, since so much new work had been done on the physiology of the Islands of Langerhans even before the discovery of insulin. Falta's account is now inadequate and the editor has not added much of the new work, although there is a bare reference to insulin. The parathyroids and suprarenals are well described.

The translation has, on the whole, been well done, although the construction of the sentences is often on German lines, and some of the translations are clumsy. The references to the literature are placed at the end of the book instead of after each chapter, but are extensive and useful. There is a good chapter index and also a full index. The book is a valuable one if only because of the amount of information which is collected together. It is well printed and bound.

UROLOGY.

By E. L. KEYES, M.D., Ph.D., Professor of Urology, Cornell University Medical College; Urologist to Vincent and to Bellevue Hospitals. London: D. Appleton and Co. 1923. Pp. 781. 35*s*.

THIS is the fourth revision of a well-known text-book. There are a number of changes. New methods have been introduced, two new sections, on suppurative inguinal adenitis and granuloma inguinale, added, whilst gonorrhœa in the female and syphilis have been dropped as having no place in urology. The book is so widely known that detailed criticism of this edition is not necessary. The author has brought the work thoroughly up to date and his recommendations throughout bear the stamp of practical experience. The prominence given to the phenol-sulphonephthalein test of renal function labels the country of

origin of the book. It seems curious to our workers that the American surgeon almost never employs such a simple and efficient test as that of the urea-concentrating power of the kidney. But there are subjects dealt with in this book, such as perineal prostatectomy and operations upon the seminal vesicles, which are inadequately treated in our own text-books. It seems a little pessimistic to speak of implantation of the ureters into the rectum for exstrophy of the bladder as a "confession of failure," but the teaching throughout is sound in a large volume on an extensive subject. The book is well illustrated and should certainly maintain its popularity.

An Introduction to Surgical Urology. By W. K. IRWIN, M.D., F.R.C.S. Edin., Honorary Casualty Out-patient Surgeon, St. Paul's Hospital for Genito-Urinary Diseases. London: Baillière, Tindall and Cox. 1923. Pp. 180. 7*s.* 6*d.*

THIS small book has been written that it may help to elucidate the outstanding features of surgical urology, a subject which the author describes as a "terra incognita to many practitioners" without justifying his criticism of his colleagues. After preliminary sections on anatomy and clinical examination, separate chapters are devoted to the several symptoms of urinary disease, such as frequent micturition and pyuria. Whilst this arrangement has certain advantages, it renders it difficult to collect the scattered information about any particular urinary condition. In the case of prostatic disease there appears a systematic chapter dealing with this derangement alone. The teaching soundly reflects the practice of English urologists. There are no illustrations.

ATLAS OF OTOLOGY.

Illustrating the Normal and Pathological Anatomy of the Temporal Bone. By ALBERT GRAY, M.D., F.R.S.E., F.R.F.P.S.G., Lecturer on Diseases of the Ear, Glasgow University. Glasgow: MacLehose, Jackson and Co. 1924. Pp. 49. £6 6*s.*

WE congratulate Dr. Gray on the production of a beautiful atlas. The plates are exquisite reproductions of the author's own photographs of specimens prepared by himself, and they must represent many hours devoted to this labour of love. A large number of the photographs are stereoscopic, a method particularly valuable in bringing out minute details of the anatomy of the temporal bone; a small stereoscope consisting of a pair of convex lenses is provided with the book. Most of the pictures are in magnification, the degree being always stated in the text, and several are photomicrographs. The atlas consists of 44 illustrations of normal and 19 of pathological anatomy, the principal subjects shown being the changes due to suppurative otitis and to otosclerosis; for his researches into the pathology of the latter disease Dr. Gray has obtained a very high reputation, which gives an additional interest to his specimens. Each illustration is accompanied by a short explanatory text. Dr. Gray states that he is aware that this work does not give a complete presentation of the subject, and hints that a supplementary volume may be published at a later date. To this event otologists will look forward with eagerness.

CURES.

By JAMES J. WALSH, M.D., Ph.D., Sc.D., Professor of Physiological Psychology, Cathedral College and College of the Sacred Heart (Manhattanville), New York. London and New York: D. Appleton and Co. 1923. Pp. 284. 8*s.* 6*d.*

Prof. Walsh has written an entertaining book on "cures which have failed"—that is, cures which have been in fashion for a season as panaceas for all mortal ills and then have died a natural death, just as their supporters did. The subject is dealt with in a tolerant, often humorous, vein. "Poor human nature," says the author, "when ailing, like a drowning man, grasps at a straw, only the amusing thing is that his mind so often turns the straw into a solid beam of hope on which he floats into the harbour of good health when he thought he was seriously ill. Why should not human nature have its delusions when they add to the happiness of men? It is not with the idea of eradicating the delusions that this book is written, but so that we may altogether laugh a little quietly at this human nature of ours and its humorous ways." Somewhat prophetically, perhaps, neither psycho-analysis nor Mr. Coué are spared. In showing that most of the "cures" were effected on the malade imaginaire, the book itself will doubtless prove a most effective cure—for a season—for that type of patient who is for ever seeking something new, and to such the physician might well prescribe it.

CLEFT LIP AND PALATE.

By T. W. BROPHY, D.D.S., M.D., LL.D., F.A.C.S., O.I., Sc.D., F.A.C.D., Emeritus Professor of Oral Surgery, Chicago College of Dental Surgery; formerly Professor of Dental Pathology and Surgery, Rush Medical College. London: Henry Kimpton. 1924. Pp. 340. 30*s.*

IN this book the author describes his views on a controversial subject, the treatment of cleft palate. It embodies the experience of 40 years and the author has operated upon a very large number of patients. Since 1915 he has performed nearly 2000 cleft palate operations and the total number to his credit is 5076. The teaching derived from such a vast experience demands our most careful attention. Though the author described a bone operation many years ago, the principles upon which it was based have not been fully appreciated in this country, where it has never been given an extended trial, and has been condemned by some surgeons perhaps too hurriedly. There is a mass of evidence retailed in this volume which speaks for the soundness of the author's methods and calls for a practical investigation of its truth. Although an enthusiast for his own operations, the author does not push his recommendations beyond the limits of prudence, and when need be employs the methods worked out by other authorities. It would require a good deal of evidence to refute two of his principles—that early closure of the cleft gives a greater likelihood of perfect speech and that tension-relieving muscular incisions in the soft palate always tend to be destructive of speech prospects. To grasp the fundamental ideas underlying the author's treatment, the book must be read. Suffice it to say here only this, that the criticism so often made that the early bone operation on infants is a dangerous one, is not supported by the statistics set forth in the book: the percentage of deaths in children operated upon during the first year of life has amounted since 1915 only to 2·9. This is little more than one-third Chicago's infant mortality for the same age, but it must be remembered that the children are required to reach a certain standard of health before operation can be contemplated.

The book should certainly be consulted by all those who treat this deformity in children.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXVII., No. 1. Pp. 1–144. January, 1924.—A Stable Preparation of Hydatids for the Complement-fixation Test, by S. W. Patterson and Miss F. E. Williams (Melbourne). An alcoholic extract of scolices from the cysts in infected men or animals, evaporated to dryness and taken up in salt solution forms a stable specific preparation for the diagnosis of hydatid disease. It should be particularly useful in places, such as England, where such diagnostic tests are wanted only occasionally.—The Significance of Anisotropic Fatty Substances in Myelomatous Tumours, by S. C. Dyke (London). A myeloma

of the head of the tibia and two tendon-sheath myelomata all show foamy cells stuffed with doubly-refractile cholesterol-esters. This is in favour of the endothelial origin of these tumours.—The Histology of the Central Nervous System in an Acute Case of Encephalitis, by C. Da Fano (London). A case of lethargic encephalitis fatal in 36 hours. The author gives a beautifully illustrated account of the histological changes and of the occurrence of the "minute bodies" previously described by him.—The Effects of Vitamin-Deficient Diets on Rats with special reference to the Motor Functions of the Intestinal Tract, by L. Gross (London).—The Morbid Anatomy, Histology, and Blood Changes in Anaphylaxis in the Dog, by H. R. Dean and R. A. Webb (Manchester and Cambridge).—The Effect of Experimental Exclusion of the Liver on the Formation of Bile-pigment, by J. W. McNee and B. Prusik (London). In 15 experiments hæmoglobin was introduced into the circulation of dogs from which the liver was completely excluded; in two cases only was the formation of any bile-pigment determined. The conversion of hæmoglobin to bilirubin does not therefore take place rapidly in the absence of the liver.—The Quantitative Estimation of Isohæmagglutination, by C. Price-Jones (London). No quantitative studies of the group agglutinations of human red cells seem to have been published. The degree of agglutination varies directly with time and the concentration of serum, and also with the concentration of red cells, thick suspensions showing relatively more agglutination than thin ones. The author was unable to separate mixtures of red cells of different groups quantitatively with a serum which should agglutinate one group only. With dilute suspensions, care must be taken to avoid contact hæmolysis.—An Aldehyde Mordant for Fats and Lipoids, by J. Lorrain Smith and T. Rettie (Edinburgh). Acetaldehyde is a good mordant in the bichromate-hæmatoxylin method of staining lipoids.—Celluloid Museum Jars, by W. D. O'Kelly (Dublin). Directions for making serviceable jars from thin sheet celluloid.—Staining Tubercle Bacilli in Formalin-fixed Tissues, by E. G. D. Murray (Cambridge). Tubercle bacilli are difficult to stain after formalin fixation; this may be corrected by the destruction of the formalin by ammonia.—The Application of a Sulphite-glucose-iron Agar Medium to the Quantitative Estimation of *B. welchii* and other reducing Bacteria in Water-supplies, by W. J. Wilson and Miss E. M. Blair (Belfast). A useful addition to the bacteriological tests of water.—The Antiseptic Action of Anil-pyridines and Anil-quinolines, by C. H. Browning, J. B. Cohen, S. Ellingworth, and R. Gulbransen (Leeds and Glasgow). A continuation of the authors' important studies on the relation between chemical constitution and bactericidal action.—Cystine in Bacterial Metabolism, by J. Gordon (Leeds). Organisms such as the coli-typhoid group and the anaerobes which can break up cystine with the formation of H_2S grow well in cystine media; more delicate organisms which cannot split it are highly sensitive to small concentrations. Serum has some protective effect.—A Malignant Tumour of Kidney, by J. B. Duguid (Aberdeen).—The Preparation of Dry Bone Specimens, by W. E. M. Wardill (Newcastle).—Digestion with Cultures of staphylococcus, *B. proteus*, and *B. sporogenes* gives good results.—The Histology of the Gall-bladders Excised from Three Enteric Carriers, by R. P. Smith (Glasgow). A subacute cholecystitis affecting mainly the interstitial tissues was found in each case, in one instance with a markedly focal arrangement.—The Germination Period and Mortality of Anthrax Spores, by M. B. R. Swann (Cambridge). The time taken till the first division of the bacillus is with young spores uniformly about 70 minutes at 37°C; with old spores it varies from two to seven hours. About 5 per cent. of young and about 55 per cent. of old spores are dead.—The Influence of the Visible Spectrum on the Growth of Bacteria in Artificial Culture, by T. J. Mackie and S. van der Lingen (Cape Town). The varying reactions of the different organisms tested cannot be summarised; on the whole, red light had the greatest inhibitory effect, but as the intensity of illumination was controlled by an actinometer it is not clear that the results are comparable. In some cases the inhibitory effect of the whole spectrum was less than that of a fraction.—A Pipette Controller for Measuring Small Quantities of Fluids, by E. C. Smith (Dublin).—Diphtheria: Problems in Schick Testing and Active Immunisation, by R. A. O'Brien (London). Five statements may now be made which are so nearly true that exceptions are of no practical importance: (1) Schick negatives are not susceptible to diphtheria; (2) Schick positives are susceptible; (3) Schick positives never harbour virulent bacilli unless they have diphtheria; (4) carriers of virulent bacilli are always Schick negative; (5) avirulent bacilli do not cause diphtheria.—Sacrococcygeal Teratoma containing Gliomatous, Chordomatous, and Ependymal-carcinomatous Tissue, by K. G. Pandalai, W. L. Forsyth, and M. J. Stewart (Leeds).

ARCHIVES OF INTERNAL MEDICINE. Dec. 15th, 1923.—Thyroid Physiology in the Control of Thyroid Disease, by David Marine, New York. Thyroid physiology is reviewed with particular reference to the effect of relative or absolute iodine deficiency on the structure of the gland. The influence of the interrenal glands on thyroid activity is dealt with and the results of adrenal insufficiency experimentally produced in rabbits are recorded. The subject is discussed in relation to the ætiology of exophthalmic goitre.—Elective Localisation in the Eye of Bacteria from Infected Teeth, by Russell Haden, Kansas City. Cultures grown from the root tip or pulp of patients suffering from metastatic eye infections were injected into 66 rabbits; 45 of these developed eye lesions. Similar cultures from the teeth of patients not suffering from eye infections were injected into 169 rabbits, and of these only 25 developed eye lesions. Case histories and good illustrations are given.—Renal Injury Produced in Rabbits by Diets Containing Meat, by L. H. Newburgh and S. Clarkson, Ann Arbour. Rabbits were fed for varying periods on a high protein diet. The majority of rabbits that ate a diet containing 27 per cent. or more of protein for six or more months developed a chronic nephropathy.—Periarteritis Acuta Nodosa, by W. Ophuls, San Francisco. Very complete clinical and pathological details of a case of periarteritis nodosa are recorded, together with micro-photographs of the lesions and extensive bibliography. The author suggests that the disease has some relation to subacute "septic rheumatic" infections.—E. B. McKinley, Dallas, reports the treatment of seven patients suffering from various infections with the bacteriophage of Twort and d'Herelle.—C. P. Miller and A. Branch, New York, report the clinical course and post-mortem findings in a case of subacute bacterial endocarditis due to a hæmolytic hæmophilic bacillus.—I. M. Rabinowitch, Montreal, maintains, on the basis of observations made on 200 patients, that the urea-concentration factor is a more sensitive test of renal efficiency than the other tests now in use.—Treatment by Splenectomy of Essential Thrombocytopenia, by N. E. Brill and N. Rosenthal, New York. The cardinal signs of essential thrombocytopenia (purpura hæmorrhagica) and the reasons for regarding it as a distinct clinical entity are given. Two cases of the disease are reported in detail, in both of which striking improvement followed splenectomy. The pathogeny of the condition is discussed and there is a bibliography.—Douglas Vanderhof reports seven cases of Subacute Combined Degeneration of the Cord with absence of free hydrochloric acid in the stomach as determined by fractional test-meal analysis. Emphasis is placed on the importance of adequate hydrochloric acid therapy in this condition.

Messrs. W. Heffer announce that two books by Dr. T. S. P. Strangeways, on "Tissue Culture in Relation to Growth and Differentiation," and on "The Technique of Tissue Culture in Vitro," will shortly be published.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

V.—TRANSFER OF PRACTICES: POINTS FOR THE VENDOR.

BY COLIN M. OLIVER
AND
OSWALD A. HEMPSON.

> It is naught, it is naught, saith the buyer; but when he is gone his way, then he boasteth.
> —Proverbs xx. 14.

IN a previous article we dealt with certain points which, it was hoped, might be useful to a medical man when seeking to purchase a practice. In this article we propose to consider a few matters which may be of interest and assistance to those members of the profession who contemplate selling the whole of, or a share in, an established medical practice.

Employment of an Agent.

Having decided to sell his practice, the first step is obviously to get in touch with likely purchasers, and to place before them as clearly and concisely as possible full details of the practice. To this end a vendor should consider first whether he desires to employ the services of an agent or to get in touch with prospective purchasers direct through the medium of an advertisement in the medical press. If the former course is decided upon, he should be careful to select a reputable medical transfer agent upon whom he can rely to safeguard his interests.

In employing an agent the vendor should realise that the agent's commission is payable by him as vendor, and before giving definite instructions for the disposal of the practice he should ascertain the scale of such commission, and on what it is actually based and to what it extends. Further, in order that there should be no possibility of dispute at a later date, he should take care to agree when such fee shall be deemed to be earned by the agent and payable to him. For example, whether when the contract is signed, when a willing purchaser is introduced, or when the purchase money is actually paid.

It is inadvisable to instruct more than one agent as if, as sometimes happens, particulars of the practice are sent to a purchaser by more than one agent they may both claim commission as being the agent instrumental in effecting the sale. Some of the better-class agents have a mutual arrangement by which in such circumstances the commission is divided between them, or else an agreement between them provides for the ready determination of the question. Unfortunately, all agents are not parties to such an arrangement, and in case of dual claims difficult questions will arise as to which agent actually introduced the purchaser, and in the end the vendor may have to pay two or more commissions. This danger can be met by arranging with the agents when instructing them that, if any such question does arise, only one commission shall be payable, which must be shared amongst them.

If the vendor prefers to dispense with the services of agents, he can do so by inserting his own advertisement in the medical press. In this event, he should take care not to give full indication of his identity or the exact locality of his practice, as it is in some cases very damaging to the practice if the patients hear that there is likely to be a change before the purchaser is actually introduced into it. In addition there is the danger of a not too scrupulous agent taking advantage of the knowledge thus gained to introduce a purchaser and thus try to establish a claim for commission.

Supply of Information.

Having placed the disposal of the practice in train, the vendor must be prepared to supply all reasonable information which a purchaser may require. At this point it is permissible to emphasise the importance of keeping clear and accurate accounts of a practice in such a form that an accountant or other investigator of the accounts on behalf of a purchaser can easily follow them so as to check the gross income for the purpose of verifying the purchase price, and to ascertain the various sources from which the income is derived.

The purchase price is usually based upon an agreed number of years' purchase of the average gross receipts for the three years immediately preceding the date of purchase. In order to enable the investigator to verify the earnings of the practice, it is most advisable to pay all takings from the practice into a banking account, whether such takings are received in the form of cheques, postal orders, or cash, as by so doing the bank pass-book acts as a check upon the figures shown in the books of account.

In a previous article we enumerated the scope of the inquiries which a careful purchaser should make when investigating a practice offered to him for sale. It is not therefore proposed to set these out again. A vendor should be prepared with all the information there suggested. He should obviously take care to state fully all the advantages of the practice, but it is of equal importance that he should not conceal or withhold information which might affect a purchaser in deciding to buy. It is true that the legal maxim "caveat emptor" applies to these transactions, but this would not be an adequate defence to an action for damages by a disappointed purchaser where there has not been a full disclosure of material facts or where there has been misrepresentation of facts. For his own protection, too, the vendor must bear in mind that whatever he may do he cannot guarantee that his successor will retain the practice which he has bought, so he should ensure that, even though disappointed, the purchaser can have no claim upon him for his lack of success.[1]

Payment by Instalment.

In the previous article also we discussed the amount of the purchase price, but it should be remembered that the prices there referred to relate to an average practice possessing no specially attractive features. Where such features exist, a vendor may ask and expect to receive an increase upon such average purchase price commensurate with the special features. He should remember that the amount to be realised is ruled by the question of supply and demand when dealing with medical practices as much as in dealing with commercial commodities.

Having found a purchaser, and having satisfied his inquiries, it is often found that such purchaser is unable to pay the whole of the purchase money in cash, and accordingly may ask to be allowed to pay for the practice by instalments. At the present time when capital is scarce, a vendor will often be well advised to accept payment in this manner, provided that a substantial amount is paid down in cash and adequate security is given for payment of the balance, and also that interest is paid upon the balance from time to time outstanding. It is, of course, essential to examine the security offered somewhat critically, as once a purchaser has entered into possession of the practice it will certainly be difficult and often disastrous for a vendor to return to it if the purchaser makes default in payment.

Security for Deferred Payment.—The security may take a variety of forms. The most usual are a guarantee by some third person, a deposit of actual securities, or, in the case of a panel practice, a charge on the panel receipts. When a guarantee is offered, the vendor should obviously make careful inquiries as to the financial standing and position of the guarantor. The guarantee can be effected either by joining the guarantor as a party to the assignment of the practice

[1] It should also be borne in mind that litigation even for the successful litigant is an expensive matter, and so the vendor should be careful to lay before the purchaser everything which is material.

from the vendor to the purchaser or by separate instrument.

It is unnecessary to comment upon the second alternative, except to point out that when a life assurance policy is offered as security, its surrender value should be ascertained and it should only be regarded as an actual security to the amount of the surrender value. A new policy which has acquired no surrender value is therefore of no actual security, except in the case of the death of the purchaser before the whole of the purchase money is paid. From this aspect a life policy is a good security, but it should be considered as a collateral only and not a primary security.

The charge upon the panel receipts—which is perhaps one of the most satisfactory forms of security—is effected by the purchaser agreeing with the vendor that the cheques payable by the insurance committee in respect of the panel patients of the practice shall be paid to the vendor until the balance of the purchase money and interest thereon is paid. It is, however, sometimes provided that such cheques shall be paid to and received by the purchaser until he shall make default in payment of any instalment or interest, in which event the vendor shall be at liberty to give notice to the insurance committee requiring the cheques to be paid to him until all sums payable have been received.

Where the purchase money is payable by instalments the vendor should insist that, in the event of the purchaser selling the whole or any share of the practice before he has paid for it in full, the balance of the purchase money then owing shall forthwith become payable, and a clause to that effect should be inserted in the assignment of the practice to the purchaser.

Book Debts.—If these are sold with the practice they must be valued in order that the purchase price may be ascertained and due allowance must be made for bad and doubtful debts. In this case, the purchaser should be given a power of attorney to enable him to collect them, such power of attorney is incorporated in the assignment of the practice. By adopting this course a vendor will relieve himself of the trouble and expense of collection.

If the book debts are not sold with the practice, it is fair that the vendor should submit to a clause in the assignment whereby he is precluded from taking proceedings to recover the amount due from any patient for a period of 6 to 12 calendar months from the date of the sale of the practice, except where a patient dies, becomes or is likely to become bankrupt, or leaves the neighbourhood, and except where the debt is likely to become irrecoverable by the operation of the Statute of Limitations unless proceedings are taken for its recovery at an early date. In this event, also, it is not unreasonable to allow the purchaser a commission not exceeding 10 per cent. upon any book debts which he may collect for the vendor.

Restraining Clauses.

A vendor must also submit to a clause in the assignment precluding him from practising within a reasonable radius from the centre of the practice. A purchaser, however, cannot ask that this radius shall be wider than is necessary for the purpose of affording him adequate protection from competition by the vendor. If it is arranged that the purchaser should have a preliminary partnership, or should serve as an assistant to the vendor before exercising his option to purchase, the vendor should insist that the agreement should also contain a clause precluding the purchaser from practising in opposition in the event of the purchase not being completed.

If the vendor is selling his practice with a view to giving up general practice and devoting himself to practise as a specialist or consultant, the clause restraining him from practice should be so worded as to permit of his so doing, but in such circumstances it would not be unreasonable for the purchaser to ask for some rebate in the purchase money by reason of the fact that the vendor is allowed to attend patients of the practice even as a specialist or consultant. The vendor also might expect the purchaser to insist on the deduction from the gross receipts on which the purchase is to be based of any fees derived from consultations or from the special branch of medicine or surgery to which the vendor intends thereafter exclusively to devote himself.

The definition of the term consultant or specialist is by no means easy, but for his own protection, and in order to avoid dispute in the future, it is very desirable that these terms should be defined as closely as possible in the assignment. It will usually be of sufficient protection to the purchaser if in such cases the vendor is bound to charge a minimum fee of from 2 to 3 guineas for every consultation upon any person who has been a patient of the practice.

The vendor must also remember that the restraining clause operates not merely for the life of the purchaser, or the period of his retention of the practice, but unless restricted in point of time by the actual terms of the assignment, it attaches to the goodwill, and the benefit of it can be assigned to the successor of the purchaser, and so on, throughout the life of the vendor.

In this article we have dealt almost exclusively with the sale of an entire practice, but most of our remarks, warnings, and comments apply equally to the sale of a share in as to the sale of an entire practice. In the sale of a share of a practice, the actual assignment is embodied in the articles of partnership which set out the rights and obligations of the parties.

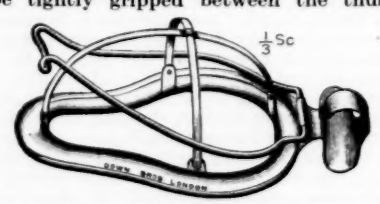
A Warning.

One last word. Every medical man, before selling his practice or a share in it, should make certain that the purchaser is a duly registered medical practitioner. This may sound obvious, but experience has shown that this is necessary, as even that excellent publication, the Medical Directory, has been misled before now, and contained the names of persons who have fraudulently assumed the name and qualifications of a deceased practitioner, and the only sure and certain test is to consult the Medical Register and there identify the purchaser.

New Inventions.

A NEW ANÆSTHETIC MASK.

THE usual pattern of the Schimmelbusch mask appears to me to have two defects: (1) The handle is made at the wrong end—i.e, the upper, or nasal, end—so that if the anæsthetist holds the handle of the mask in one hand and a drop bottle in the other he cannot control the patient's jaw at all readily. (2) The handle itself is a small piece of plain metal, which must be tightly gripped between the thumb and



one or more fingers to hold it in position, leaving the ring and little fingers, the least efficient fingers, to support the jaw. To overcome these defects I have had a mask made, shaped to the face, and fitted with a handle at the lower, or chin, end. Further, in place of the ordinary handle I have suggested a ring grip for the fingers, which allows control of the mask without constant apposition of thumb and fingers, permitting greater freedom and less fatigue. The grip may be single or double, but in most cases I think the single ring will suffice. Messrs. Down Bros. have made the mask for me, and have taken great care and trouble in carrying out my suggestions.

GEOFFREY DUNDERDALE, M.D. Lond.
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THE LANCET.

LONDON: SATURDAY, FEBRUARY 2, 1924.

THE DECLINE IN TUBERCULOSIS.

TUBERCULOSIS is a department of medicine in which it is notoriously difficult to see the wood for the t.b.'s. The individual worker is all too ready to attribute the reduced mortality from the disease to individual methods in which he is personally interested, while the central observer who studies the epidemiological curve may become sceptical of the value of effort at all. To both of these Dr. A. S. MACNALTY's comprehensive review of tuberculosis work in England, which appeared at the front of our last issue, may help to bring perspective. Dr. G. LISSANT COX spoke of the organisation of county schemes recently at the Royal Institute of Public Health (THE LANCET, Jan. 26th, p. 213). We leave these reviews to speak for themselves, and turn to the problem as it presents itself in America. In the year 1900, the first year for reliable statistics on tuberculosis for any large part of the United States, the death-rate from this disease was 195 per 100,000 of population. In 1910 it had become 165 for the same geographical area, a drop of 15·6 per cent., and in 1920 it had fallen to 112, or nearly 43 per cent. lower than in 1900. In the experience of some 15 million persons insured in the Industrial Department of the Metropolitan Life Insurance Company, between 1911 and 1921 the death-rate had declined over 49 per cent., a figure even more remarkable than that for the entire population. To the causes and auxiliary conditions which can be regarded as having helped in securing this result, Dr. LOUIS I. DUBLIN has devoted an interesting address, delivered before the American Tuberculosis Association and now reprinted, which has a useful bearing on English experience.

Two explanations are given of this change in the experience of America and of other countries, the first alleging that the change is due primarily to activities within human control, while the second minimises the importance of environmental factors in the control of tuberculosis, and emphasises the all-importance of the genetic—that is, the constitutional factors. Infection is admittedly necessary, but according to the geneticists, the fate of those infected depends on inherited qualities. If the latter view prevails it follows that current anti-tuberculosis activities are relatively unimportant, and that in this matter "natural selection may have done more for racial health than medical science." In analysing the facts bearing on these two views Dr. DUBLIN lumps together all environmental factors, leaving almost undiscussed the question as to the relative value of different measures—e.g., early treatment of the sick, segregation of advanced and bedridden patients, familial and industrial hygiene, improved nutrition, &c., and we may do the same, while expressing the hope that a later effort may be made to associate and evaluate different environmental factors with varying degrees of fall in the tuberculosis death-rate. Meanwhile the broad argument as to the relative value of environmental factors in toto and of genetic influences as developed in Dr. DUBLIN's address deserves summarisation. How do the extreme variations in the geographical distribution of the death-rate from tuberculosis concord with the genetic view? It is not likely that the people living in Akron (death-rate 47) are inherently more healthy than those in New Haven, Conn. (death-rate 81). So likewise the difference between urban and rural death-rates and between various rural districts cannot be entirely explained on such a hypothesis. A similar remark applies to the local variations in tuberculosis mortality according to age and sex. If genetic influences are preponderant, how does it arise that in the experience of the Metropolitan Company the male death-rate among whites now reaches its maximum at the age of about 42 and is then 477, while the female maximum is at the age of 27 and is 240 per 100,000? The changing relationship of the death-rate in the two sexes with advancing age is difficult to explain except as the result of changing environment.

The racial incidence of tuberculosis is compatible with the view that in the development of this disease an inherited racial immunity plays a part. The experience of exceptionally low mortality from tuberculosis among Russians and Jews and Italians in the United States is regarded by Dr. DUBLIN as supporting the above-stated view, and even more striking evidence as to racial differences has been adduced by Dr. G. E. BUSHNELL and Prof. LYLE CUMMINS. Whether these differences are evidence of the working of natural selection or arise from varying degree of exposure to infection in early life, or whether in the case of the Russian, Jew, and Italian experience they may be attributed partially to the greater amount of fatty food (e.g., olive oil) in their dietaries or to all these factors, cannot be completely decided in the absence of more complete evidence. But even if, as is possible, race bears a part in the result, environment plays its part to colour the racial picture, and in all cases a higher or a lower death-rate is obtainable with various modes and stations of life. The well-known variations in the death-rate from tuberculosis in accordance with economic level, of which a striking example in insurance experience is given by Dr. DUBLIN, and, still more, occupational variations in mortality from tuberculosis, point to the predominant influence of environment. The strongest and most enterprising rural population migrate into towns; but in the English Registrar-General's statement of occupational mortality there are no less than 26 occupational classes which show a mortality from phthisis almost four times as great as farmers. To indoor industries must be attributed this difference in the main, when the special alcoholic industries are excluded, and in producing this result massive infection as well as reduced resistance of the operative plays a chief part. Perhaps the most enlightening portion of Dr. DUBLIN's review is that showing recent changes in the tuberculosis death-rate. In his insurance experience a reduction approximating 50 per cent. has occurred in 11 years. The greatest decline has occurred where the rates were originally highest and least where the rates were lowest. In America the age-incidence of the disease has changed to a remarkable extent, showing that age-incidence is a fluid phenomenon "responding," to quote his words, "quickly and incisively to external modifications when these are properly chosen and well directed." Compare these changes with the increased tuberculosis death-rate in many European countries, and the picture is consistent far more with the first than with the second of the two explanations—with environmental rather than with genetic influences.

This explanation, furthermore, gives hope for the future and stimulus in the pursuit of all known measures of prevention. The lines of action which have

been most closely associated with the decline already secured have been dual in character. Massive and repeated infection, especially of the young and adolescent, have been rendered less common and their dosage decreased; and many influences, including educational, have combined to produce more cleanly habits of the people, reduction of dust, and other evils in industrial life, and generally improved nutrition of the population. The dissection of the relative value of these and other environmental factors is a task of great complexity for which the data possibly do not exist; and personal differences of opinion as to the importance of each factor meanwhile will persist. But this is of relatively small practical importance if the principle of attack on tuberculosis from every point of view be accepted. It is by combined attack on all lines, carried forward with confidence and perseverance, that we may anticipate ere long, in this country as in America, a general tuberculosis death-rate of 50 per 100,000. This figure has already been attained in New Zealand and in Australia, and Dr. DUBLIN anticipates the attainment of the same figure in the United States by the year 1930.

NATIONAL HEALTH INSURANCE.

THE Court of Inquiry into the remuneration of insurance practitioners, whose deliberations were summarised in our pages last week, reported just after we had gone to press. The award is as follows:—

> The amount of the capitation fee per insured person per annum on the basis of which the Central Practitioners Fund under Article 19 of the National Health Insurance (Medical Benefit) Regulations, 1924, should be calculated as from the 1st January, 1924, so as to afford adequate remuneration for the time and service to be given by general practitioners under the conditions set out in those Regulations in connexion with the medical attendance and treatment of insured persons, due regard being had to the service in fact rendered under the Regulations hitherto in force (such capitation fee not to include any payment in respect of the supply of drugs and appliances nor any payments to meet the special conditions of practice in rural and semi-rural areas), is nine shillings.
>
> In the course of the inquiry it was stated on behalf of the Minister of Health and the Secretary for Scotland, and on behalf of the British Medical Association that our finding was only intended to be binding for the year from the 1st January, 1924, to the 31st December, 1924, but that both parties desired the Court to make a recommendation covering such longer period as we should think fit.
>
> We therefore recommend that the capitation fee of nine shillings so found by us should remain in force for a period of three years from the 31st December, 1924.

Thus the capitation fee regarded by the Court as adequate remuneration for the practitioner's time and service exceeds by 6*d.*, or nearly 6 per cent., that offered by the late Minister of Health, and its award fully justifies the appeal by the insurance medical service to an independent tribunal. The Court recommends that the capitation fee now awarded should remain in force until Dec. 31st, 1927, a period which will ensure the tranquillity so desirable for the smooth working of medical benefit under the Insurance Acts. During that period the Royal Commission can inquire without distraction into the conditions under which this medical benefit can best be administered.

It is significant that just at this moment proposals have been made for creating a new system of health insurance in France. These proposals, which were described by our Paris correspondent last week, are as yet not elaborated in detail. French legislation tends to pass laws which are sometimes mere statements of general principles, the details of administration being left to be worked out by regulations made by the executive. Even in Great Britain, where this tendency is not so marked, the law of health insurance is not operated without a vast number of subsidiary regulations, so that no one, for example, could understand the relation of the medical profession to the State system under the National Health Insurance Acts without studying the latest medical benefit regulations. It is therefore not easy to judge of the French project until it reaches the stage at which the executive works out the details. As a matter of principle, however, it may be assumed that the State will not wish to wreck its scheme by estranging the good will of the medical men on whose coöperation its success depends. Remembering our own controversies on this side of the Channel, we shall watch with interest and sympathy the efforts of the *corps médical français* to preserve its independence and to secure a position which shall be safe from the pressure of outside influences. The financial arrangements of any scheme of national health insurance must depend on actuarial information of a kind not always at first available. It is stated that the only information of this sort in France is that acquired by the French mutual benefit societies, but it is doubtful whether the benefits given by those societies are on a scale comparable to those now proposed. The misfortune of the medical profession is that, when such financial arrangements are found to have been based on too optimistic a scale, there is usually an attempt to make a revision of them at the expense of the doctors. The profession, in fact, has to guard itself against three possible perils. First, it must protect itself from being asked to do something foreign to its wishes and traditions; professional confidence must remain sacred; a doctor must not be required to undertake the treatment of an impossible number of patients, nor can he be expected to act as magistrate and policeman towards the malingerer. Secondly, the profession must retain control of professional standards and of disciplinary decisions. Thirdly, the financial arrangements must provide a fair reward for work properly done. To fix a total of administrative cost and then, after various deductions therefrom, to leave the medical profession to an undignified scramble for remuneration out of a fluctuating balance—that is one way and the wrong way. The other way is first to fix the proper remuneration for the necessary professional services and treatment, and then to construct a financial scheme which shall secure the payment of that remuneration irrespective of other considerations. The medical profession in France, with its noble record of public service and of successful research, may be trusted to work the new proposals to the public good.

The new scheme may take a little while to mature. A *projet de loi* brought forward in France suffers many changes before it becomes actual law. Its initiator has much less control over its subsequent form and its progress through the legislature than has a Minister in charge of a Government Bill at Westminster. Two political considerations may perhaps also be mentioned. National health insurance has a German ancestry—a fact which not every nation will regard as a recommendation; and the patriotism which is preparing itself to lift the franc back to its normal exchange value may have to postpone schemes which make a further demand upon the public purse.

THE BETTING HABIT.

THE proposal to put a tax upon betting has drawn attention to the extent to which this form of gambling has become an organised part of social and economic life. Whether there is anything intrinsically wrong in making a bet is capable of vigorous but inconclusive argument; there can be no doubt as to the noxious results of the betting habit. The amount of money passing through the hands of bookmakers is by some people regarded as immaterial as far as the general community is concerned; it is only transferred from one set of pockets to another, but the amount of energy involved in the transfer may well be a matter of public concern. The maintenance of thousands of bookmakers, with their touts and assistants, the output of sporting prints, the postal work involved—in fact, the whole machinery of betting at best forms a luxury trade which in the end can scarcely be to the general advantage. At the worst it is a useless waste, involving continual loss to the class of habitual bettors and frequently leading to disaster and crime. It is a peculiarity of this betting system that the backer of a horse rarely bets with his fellows, but employs the bookmaker as an intermediary. In some countries the totalisator largely replaces the bookmaker, and a known percentage of the amount passing through the machine is deducted before the remainder is divided amongst the successful backers. In either case the result is a steady depletion of the funds of the habitual bettor. This being so, backing horses as a means of making money should not appeal to those accustomed to close reasoning, and yet it may be observed that a large amount of mental effort is spent by quite intelligent people in studying, pencil and paper in hand, that quality called "form" in an attempt to "defeat the bookies." The bookmaker, meanwhile, if he knows his trade, is invincible, and the only person defeated is the student of form or someone else pursuing an equally unreliable scheme for outwitting arithmetic.

The man who makes a casual bet or takes a share in a sweepstake presents no problem; that the breeder or trainer of racehorses, and those immediately connected with the industry, should make wagers seems a part of the business, though there are exceptions occasionally when one hears of people in this industry who never bet; and a visit to a race meeting with an incidental bet or two makes up a comparatively harmless day's recreation. But a feverish interest in betting for its own sake now possesses masses of people, and, since this interest leads only to loss of money and secondary disasters both in the home and in relation to employment, the causes for it must be sought elsewhere than in the sphere of conscious motivation. These causes can only be guessed at, but probably rest upon character traits common to mankind. The thwarted will to power that underlies many neurotic performances may find an outlet in pitting one's judgment against that of others, and the man who offers gratuitous "tips" to friend or stranger—often by the quaint process of writing them upon the wall of a public lavatory—may taste for a moment the sweets of superior knowledge. Pride or conceit, often a compensation for a feeling of inferiority, produces a belief that the individual concerned is not as other men, but can succeed when they fail. If these suggested motives seem too indirect, simpler ones may be sought in the power of example, the desire of getting something for nothing, or the craving for excitement. Whatever motives are suggested, however, frustrated desire appears in most of them. The contented man whose interests are satisfied is no more likely to fall a victim to the betting habit than to alcohol. We must conclude that the physical and spiritual surroundings of many people do not satisfy their needs, and that self-control and common-sense are too weak to withstand the tendency to seek escape from reality in the excitement and fantastic hopes of the gambler. This view accords with the evidence given before the recent Commission showing that the practice is most widespread in those classes where life is most dull. In considering the problem it is plain that we can be guided neither by those who boldly maintain that the desire to gamble is inherent in human nature nor by those who, inspired by the best intentions, would solve it by making betting a crime. The betting habit, like alcoholism, delinquency, and other sociological difficulties, cannot be solved by direct attack upon the symptom.

RESEARCH IN FOOT-AND-MOUTH DISEASE.

WHILE the immediate brunt of the epidemic of epizoötic stomatitis is abating, the desire to take advantage of its lessons is assuming more definite form. In our present issue Dr. J. A. Arkwright, of the Lister Institute, who was in charge of the research work on board ship in 1921, pleads for the faith and courage to set up and maintain a proper experimental station on land. Easy though it would be to leave research to countries where the disease is ever present, Dr. Arkwright points out with great cogency that the problems are not the same for our own country where means should be adapted to the protection of our insular position. Experimental study, already made difficult by the policy of slaughter, has been further impeded by the belief that rodents were immune to the virus. This statement by Löffler and his colleagues has now been set aside, and it has been shown that the virus can be kept active by passage through a series of guinea-pigs. We also print from the Liverpool Bacteriological Department a piece of work of the first importance on infected rats. To this department glands were brought from the carcasses of cows sent to the abattoir as non-infected but having been in contact with cases of foot-and-mouth disease. Prof. J. M. Beattie and Mr. David Pedden fed these glands to rats which developed œdematous swelling of the feet, vesicles between the toes, and patches of gelatinous œdema in the lungs. The special localisation of the lesions is that of the disease in cattle, apart from the condition of the lung, which has apparently not been described before. Should this work, which has analogies with the observations upon guinea-pigs by Waldmann and Pape, be confirmed, an important avenue for investigation is opened up in view of the infected rat as possible carrier of the disease. Moreover, as the authors point out, rats can be easily isolated and the risks of investigation reduced to a minimum. There is no doubt that the Board of Agriculture should consider resumption of the truncated work of 1921.

INDEX TO "THE LANCET," VOL. II., 1923.

THE Index and Title-page to Vol. II., 1923, which was completed with the issue of Dec. 29th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

Annotations.

"Ne quid nimis."

HOPE FOR THE LEPER.

A FORMAL campaign against leprosy is being inaugurated this week in London. The precise extent of the disease throughout the world is not known with accuracy, although there are probably about 500,000 lepers in India and twice as many in China. The northern section of the New World is comparatively free—Mexico being an unknown quantity—but in the southern republics, colonised from the Iberian Peninsula, only Chili appears to be free, and Colombia, a former centre of slave import, is credited with a high proportion of lepers. Missionaries state that Sao Paulo in Brazil has a higher comparative rate of non-segregated leprosy than any other city in the world. Oceania has some high rates, but Australia is free with the exception of the coastland of tropical and sub-tropical Queensland. Sir Leonard Rogers recently estimated the total leprous population in all countries at 2 million, or 3 million if the early cases are included in the calculation. Fortunately, the effectiveness of the chaulmoogra treatment is opening up great possibilities both for the individual and for the infected neighbourhood. Clinical improvement is by no means rendered void by the fact that pharmacologists have not yet been able to agree as to which of the constituents of chaulmoogra oil it is that possesses therapeutic value. Much still remains to be done in isolating the active ingredients. But the latest advances towards the solution of the problems of leprosy have been chronicled in our columns, and their story warrants the hopeful attitude adopted by the leaders of the new campaign.

Under the British rule, apart from India, leprosy has to be dealt with in the tropical African colonies, in Ceylon, the Malay States, Malta, and Cyprus, and the Imperial responsibility implied has led to the foundation of the British Empire Leprosy Relief Association, with the Prince of Wales as patron, and the Viceroy of India and the Governors-General of Canada, New Zealand, and South Africa as Vice-Presidents. Lord Chelmsford is chairman of the General Committee and Sir Leonard Rogers chairman of the Medical Committee. The aims of the Association are:

(1) To help all lepers in the Empire by providing the latest treatment for all, and houses for those who are homeless and destitute.

(2) To supply the latest medical information and the most improved drugs to leper institutions, settlements, and hospital clinics; and to train those in charge of lepers in applying the treatment efficiently.

(3) To support sound schemes of segregation, with the best treatment, in countries where large numbers of lepers ought thus to be dealt with.

(4) To collect information and statistics and to issue bulletins of information and advice to all working amongst lepers.

(5) To support further researches on both the ætiology and treatment of leprosy, with a view to discovering more efficient methods of prevention, and to further simplify, shorten, and cheapen the curative measures.

The movement is being formally launched at a Mansion House meeting as we go to press, where the speakers include Lord Chelmsford, Sir Humphry Rolleston, and Sir Leonard Rogers. The appeal should meet with a ready response in the light of the assurance given by Dr. E. Muir, working at the School of Tropical Medicine in Calcutta, who is able to state his belief that in all early cases the arrest and retrocession of the disease, up to a relative cure, may be expected if diet, exercise, and general sanitary conditions are favourable, and if the chaulmoogra treatment is continued for a sufficiently long period of time. In one of the large Indian asylums the mortality has already been reduced to one-fifth of its former rate. Reports in the quarterly magazine of the Mission to Lepers repeatedly mention the special treatment and the new atmosphere which its application is bringing into leper colonies.

THE TREATMENT OF INCOMPLETE FEBRILE ABORTION.

SOME recent papers, contributing statistical evidence on behalf of the conservative, expectant treatment of incomplete febrile abortion, would suggest that the superiority of this course over the routine immediate evacuation of the uterus was established. But as recently as 1922 the well-known German gynæcologist, Prof. A. Döderlein,[1] of Munich, expressed himself as follows: "I regard it as a fatal heresy to recommend expectant treatment in febrile abortions." Prof. Döderlein's views, it may be remembered, were those of unchallenged orthodoxy less than a generation ago, and when Prof. G. Winter, of Königsberg, ventured to plead for expectant rather than active treatment some score of years ago the opposition he encountered was formidable. He has, however, repeatedly returned to the charge, and in his most recent publication [2] he is supported by an impressive show of statistics. He finds that this controversy has yielded 267 original articles, dealing with about 24,000 febrile abortions. Among 276 cases treated on expectant lines there were 178, or 64·5 per cent., in which abortion was terminated spontaneously. It was also found that among 6512 cases of abortion treated by digital evacuation the mortality was 2·9 per cent., whereas among 1048 cases in which abortion was completed spontaneously the mortality was only 1 per cent. Prof. Winter thinks bacteriologically in this matter, and he has come to the conclusion that the fate of the patient largely depends on the nature of the infecting organism. He has collected the 2080 cases reported by 21 observers publishing their bacteriological findings, and he has found that the mortality ranges from 7·3 per cent. to 20·8 per cent., according to the nature of the infecting organism, hæmolytic streptococci being the most toxic. He suggests that, whenever it is possible, a bacteriological examination should be made of the vagina, and that when hæmolytic streptococci are found no attempt should be made to evacuate the uterus till they have disappeared. In the absence of a bacteriological examination he urges that evacuation of the uterus in the febrile stage of an abortion should not be attempted forthwith, and when expectant treatment is not followed by the spontaneous expulsion of the ovum evacuation of the uterus should be with a blunt curette rather than with a finger.

Prof. Winter has had many followers, one of the earliest being Dr. Emil Bovin, of Stockholm. His last paper [3] on this subject contains a statistical analysis of the 1141 cases of incomplete febrile abortion treated at his hospital up to Dec. 31st, 1922. Though the period under review included the pandemics of influenza and the deprivations of the late war, he had to record only 24 deaths (2·1 per cent.). In 623 cases the abortion was completed spontaneously, the mortality being only 1·3 per cent. Among the 518 cases in which expectant treatment had to be given up and evacuation of the uterus performed there were 15 deaths, or a mortality of 2·9 per cent. There were considerable differences in the results, according as evacuation was performed during, or some time after, the febrile stage; the mortality was 1·9 per cent. in the latter class, and as great as 8 per cent. in the former. Like Prof. Winter, Dr. Bovin has found that giving quinine frequently by the mouth for a few days favours the spontaneous completion of an abortion. During the three years 1920–22 expectant treatment alone was successful in 241 out of 366 cases of febrile abortion (65·8 per cent.), partly, at any rate, owing to the use of quinine. However conflicting opinions may be as to the best course to pursue in the treatment of incomplete febrile abortions, there seems to be little doubt that most of them represent criminal acts. It is, of course, often difficult to obtain reliable information on this point; much depends on the desire and ability of practitioners to elicit information from their patients. In this connexion Dr. Bovin refers to investigations published

[1] Dent. med. Woch., Jan. 5th, 1922.
[2] Ibid., Dec. 21st, 1923. [3] Hygiea, Dec. 31st, 1923.

in 1922 by Dr. Richter, of the Swedish Allm. Barnbördhuset. Among the 107 women admitted to hospital between September, 1920, and April, 1921, suffering from febrile abortion and a temperature exceeding 38° C. there was not one who failed to admit that criminal abortion had been attempted.

THE PREVENTION OF STREET ACCIDENTS.

STATE medicine is a wider subject than public health, for it has its forensic as well as its preventive side; but neither of these titles in their ordinary acceptation in this country comprises the prevention of accidents from machinery or from traffic or otherwise. Thus outside the sphere of activities of local sanitary authorities and county councils—and never hitherto proposed to come within the control of the central Ministry of Health—there lies preventive work of great public importance, by the execution of which much loss of life and many minor injuries might be obviated. Of such work the prevention of accidents forms a most important part. Its importance is brought home to us by a valuable report of the American National Safety Council on "The Warning of Public Accident Statistics." The work of this Council illustrates to how great an extent in the States important public health functions are being carried out by voluntary associations. It is not surprising to find that large accident and life insurance societies and traffic engineers of railways and large industries form the Accident Statistics Committee of the Public Health Section of this National Safety Council.

The statistics displayed by them are startling. In 1922 there occurred 75,300 fatal accidents in the United States; the number would have been 35,000 to 40,000 fewer if they had occurred on a scale according with the experience of England. Of this number the automobile was the chief cause of fatal accidental injury, and accounted for 18 per cent. of the total accident budget. This increase is the more noteworthy in view of the fact that the automobile death-rate was 24·0 in 1915 and 11·6 in 1922 per 10,000 automobiles registered. The regulation of automobile traffic has improved, but the mass of destruction of life has nevertheless augmented. It is noteworthy, further, that the automobile death-rate per 10,000 automobiles registered varied from 2·98 in Chicago, 2·90 in New York, and 1·05 in Los Angeles to 0·47 in Salt Lake City. The question remains as to whether the blame for these great variations in death-rate is due to carelessness of pedestrians or of chauffeurs, or to variations in the permeability of streets and the regulation of traffic. The report in hand does not profess to answer these important questions in detail, but it gives most valuable information throwing light on them; and it serves, further, as a remarkably excellent example of the fact that statistics carefully collected and intelligently analysed may give a valuable lead on problems of life-saving. In the cities for which statistics are given children under 15 years of age formed on an average 37 per cent. of the persons killed. In the city of New York they formed 50 per cent. These figures clearly indicate that it is not merely additional precautions on the part of the pedestrian that are needed, but that additional safeguards are called for to protect him. The Committee lays stress on the importance of traffic movement studies in showing how to diminish automobile fatalities. The first essential is the preparation for each town of a "traffic-artery" map, which usually would show possibilities of diversion of traffic on a considerable scale. The Committee's definite conclusion is that in most cities traffic congestion is due to the ineffective use of street areas rather than to the lack of them. We wonder whether even in London the police authorities could show that the present deplorable amount of traffic congestion is not capable of being materially reduced by application of this axiomatic statement. The next point which is stressed is the importance of each city maintaining spot-maps of traffic accident occurrence, by means of which an approach might be made to a determination whether the troublesome nature of the road itself or the lack of traffic discipline is more to blame. Such spot-maps form the first line of guidance in control and diversion of congested traffic.

We have merely indicated a few of the many important points comprised in this valuable report, which should be studied by all interested in this problem. The prevention of accidents, especially now that automobile accidents are becoming increasingly a serious cause of death, is of interest to all medical men; the proper control of traffic and the reduction of congestion at certain points concerns them as busy messengers of health intent on carrying out their mission in life.

A NEW TEST FOR TYPHOID FEVER.

Dr. E. Moretti,[1] of the Ospedale Maggiore, Milan, has devised the following modification of Petzetakis's iodine reaction for the diagnosis of typhoid fever. 25 c.cm. of urine are saturated with 20 g. of crystallised ammonium sulphate. After about a quarter of an hour the urine is filtered and diluted to about a third if it is too thick. To 10 c.cm. of the filtrate one-fifth of its volume of a 10 per cent. solution of sodium hydrate is added, and then a drop of a 5 per cent. tincture of iodine. The solution is then shaken, and if the reaction is positive a persistent golden-yellow colour is produced. Out of 100 cases of typhoid fever in which this test was tried, it was positive in 95 and negative in only 5, which were remarkably mild cases in which the temperature became normal at the beginning of the third week. In two cases of paratyphoid A the reaction was negative, while it was positive in two out of three cases of paratyphoid B. In the great majority of all the typhoid cases the reaction was positive in the first week, and very frequently during the first few days of the disease. The intensity of the reaction increased until the disease reached its height and then gradually decreased as the symptoms subsided, the reaction becoming negative before the temperature reached normal. The reaction was also invariably positive in pulmonary tuberculosis with cavity formation, very frequently (80 per cent.) positive in cases in the second stage, and occasionally (20 per cent.) positive in the first stage. It was often positive during the height of pneumonia and measles, and always negative in malaria and acute rheumatism. The iodine reaction is thus positive in the same diseases as the diazo-reaction, and like it is an expression of an increased elimination of urochromogen. It is of greater diagnostic value than the diazo-reaction owing to its earlier appearance, greater constancy, and longer duration. In Dr. Moretti's cases the diazo-reaction was positive in only 78 per cent., and, as a rule, did not become so until the first half of the second week.

THE HISTORY OF PERCUSSION AND AUSCULTATION.

IN another column we publish an abstract of an address delivered by Sir William Hale-White before the Midland Medical Society upon the History of Auscultation and Percussion. Broadly speaking, we may say that these methods of diagnosis did not come into use until the beginning of the nineteenth century, and, though Hippocrates knew the succussion splash, until the discovery of the X rays in 1895 auscultation and percussion remained the sole means by which the physician could form any opinion as to the conditions existing within the chest, other than the nature of the sputum. It is easy to be wise after the event, and when we read the treatises of Auenbrugger and Laënnec to say "Why did no one think of this before?" Auenbrugger was born in 1722 and Laënnec died in 1826. For nearly the whole of these hundred years Europe was convulsed by wars, and there was no soldier who beat the ground with a

[1] Riforma Medica, Nov. 19th, 1923.

musket-butt to ascertain the presence of a cavity which might be a mine, or who, in the same way, knocked a cask to ascertain whether it were full or empty, or partially so, or who listened with his ear to the ground for the approach of cavalry, or to hear the scraping of a shovel or a pick by approaching miners, who was not practising and profiting by auscultation and percussion. Some army surgeons of the time must have seen these practices or even have taken part in them themselves, and yet to none did it occur that if a partially filled cask gave a different note above the level of the fluid, to that which it did below, the same law would hold good for the presence of fluid in the chest; or that if the scraping of a pick or shovel could be heard, the scraping of two roughened surfaces within the chest could also be heard. Until the advent of the two men who had ears to hear the medical profession made no use of what in other fields of activity was common knowledge. Both the treatises of Auenbrugger [1] and Laënnec,[2] the latter with biographical notes by Sir William Hale-White have been recently reprinted, and rendered accessible to English readers.

A SYLLABUS FOR SCHOOL SCIENCE.

HARDLY anyone is satisfied with the present state of science teaching in schools, and the recent attempt by the General Medical Council to push chemistry and physics back into the school period has made the questions involved of more immediate professional interest. The difficulty seems to be this. Schoolboys are too immature to get any real advantage from the natural sciences, as ordinarily taught, because they cannot apprehend the generalisations which alone give the subjects as such any real meaning, and the common discipline of experiment, observation, and verification thereby becomes a barren and uneducative toil. Biology seems in a distinctly better position than chemistry because its general ideas are not difficult for young people to grasp, but as a matter of fact biology is much less, and possibly worse, taught in schools than the other subjects. Those who have taught science in schools have tried to apply the methods suitable for university students with the addition of as much water as they deem necessary, and the result is so mawkish and unsatisfactory that many college teachers have expressed their preference for boys who have not "done stinks" at school. As a leading article in *Nature* (Jan. 26th, p. 113) points out, the vicious circle is completed by the fact that the precise scope and mode of school science are really determined by those of the matriculation examinations imposed by the universities.

The writer in *Nature* makes out a strong case for the substitution of "general science" for the formal procedures which obtain at present—for a course, that is, which will give the schoolboy some idea of how the world works and which will whet the appetites of a certain number to go on further and deeper when they have the chance. And being constructive as well as critical he sets out a guiding syllabus for such a course taken from the Book of Wisdom:—

> Knowledge of the things that are, namely, to know how the world was made, and the operation of the elements.
> The beginning, ending, and midst of the times; the alterations of the turning of the sun, and the change of seasons.
> The circuits of years and the positions of stars.
> The natures of living creatures, and the furies of wild beasts; the violence of winds, and the reasonings of men; the diversities of plants, and the virtues of roots.

Even the wisdom of Solomon is not fool-proof, and there are loopholes here for the naughtiness of the astronomer who wants to make his subject a peg for computation, and of the botanist whose chief interest in a root is to know when it is not a root. But something of this kind in good hands would surely lay a more satisfactory foundation for medical education than the present imitation of grown-up knowledge. The experiments in teaching such general science which have been made in America, and the text-books which have been produced there, seem clearly to show the possibility. One danger alone is obvious, and that is a very real one: there must be no idea that "general science" is a royal road to knowledge. Properly used it hardly arrives at knowledge at all; it is a sort of map on which the student may see what places exist and get some indication of how to get there. Like more earthly maps, it will encourage dreams of happy journeys.

[1] Leopold Auenbrugger's Inventum Novum, THE LANCET, 1923, i., 84. [2] THE LANCET, 1923, i., 1270.

GEOGRAPHICAL DISTRIBUTION OF PROSTATIC HYPERTROPHY.

Dr. E. Pfister,[1] of Dresden, remarks that while geographical differences have long been recognised in regard to other urological diseases such as calculus, the literature on the geographical distribution of prostatic hypertrophy is very meagre. Most of the data have been derived from warm countries only, such as Egypt, Japan, Southern China, India, and the Philippine Islands. The experience of Dr. Pfister, who was for many years physician at the Deaconess Hospital at Cairo, agrees with that of other surgeons who have practised in Egypt, that hypertrophy of the prostate is much rarer in that country than in Europe. Kitagawa and Takagi, whose observations were based on post-mortem studies and not merely on clinical examination, reported similar results in Japan. Hypertrophy of the prostate appears to be less prevalent in the Philippines than elsewhere, as Dill had never observed a case in the large number of patients at the Philippine General Hospital at Manila. J. O. Thomson states that the condition is rare in Southern China, and according to Kenneth M. Walker it is infrequent among the inhabitants of India. Buschan and Ruge have found that it is also rare among negroes, in whom, as Dr Pfister had shown in 1913, calculus is also uncommon. On the other hand, it is noteworthy that in the Tirol, where goitre is endemic, hypertrophy of the prostate is frequent. This association finds its analogy in dogs in which hypertrophy of the prostate is often accompanied by goitre. In any case inflammation does not appear to be causally connected with enlargement of the prostate, as gonorrhœa is exceedingly prevalent in those countries in which hypertrophy of the prostate is rare, and in Egypt, where bilharzia frequently causes inflammation of the prostate, hypertrophy of the organ is very uncommon.

[1] Urological and Cutaneous Review, December, 1923.

THE RÔLE OF THE SPLEEN IN THE PRODUCTION OF IMMUNITY.

FROM many sides evidence accumulates of a new movement amongst those workers in physiological and pathological fields whose chief interests are concerned with problems of immunity. The rich promises of the epoch which began with Pasteur have not been in every respect fulfilled, the brilliant results of the discovery of the development of antibodies after the inoculation of some micro-organisms must be set off against the disappointments which have followed the most painstaking endeavours to secure immunity in the case of certain other infections. Impressed by such failures there is a growing group of workers who are seeking to elucidate immunological problems from a different point of view. An example of such work is to be found in the paper by Dr. Ivan I. Manoukhin which was published in THE LANCET of Jan. 26th. In this article the author records the remarkably successful results he has obtained by the application of X rays to the enlarged spleens of a large number of cases of chronic malaria. The cases treated included tertian, quartan, pernicious, and mixed infections, and the results appear to have been remarkably successful. Dr. Manoukhin is at pains to emphasise that his successes have been especially in that group of cases in which induration and fibrosis of the spleen were least marked, an effect which he explains on the basis of a theory that irradiation of the spleen

stimulates what he terms the "leucocytolytic" properties of that organ. Without dwelling further on what must admittedly be at present an hypothesis not yet fully proven, we would direct the attention of our readers to this work as evidence of those still obscure relations of the spleen to immunological processes. It must surely be true that future developments will bring new and useful information from inquiries of this nature. As a further example of current work pointing in a similar direction we may quote a recent paper [1] by W. S. Lazarus-Barlow and R. H. Parry, who showed that the introduction of grafts of Jensen's rat sarcoma into the splenic tissue of rats produced a higher general resistance to subsequent subcutaneous inoculation with the tumour than if immunisation were attempted by intracranial or subcutaneous introduction in the first place. They further showed that intrasplenic inoculation definitely retarded the growth of an established subcutaneous tumour in the rat, even though actual disappearance of the tumour was not achieved. These facts cannot, we believe, be fully explained by any existing theories of splenic function; that they are still inexplicable is not the least promising feature in these interesting observations.

THE SLIT-LAMP IN OPHTHALMOLOGY.

SOME years ago Dr. Gulstrand, a Swedish ophthalmologist, invented a new method of illuminating the anterior parts of the living eye, by means of which, combined with a binocular (so-called) corneal microscope, it is possible to observe structures which by the methods hitherto in ordinary use cannot be seen. The apparatus consists of a strong light focused on any desired part of the eye by a system of lenses through an adjustable slit, producing a prism-shaped area of illumination which, viewed with a binocular magnifier of about 24 diameters by the dark-adapted eyes of an observer, displays such objects as the nerve fibres in the cornea or the blood corpuscles circulating in the corneal vessels. The apparatus is somewhat expensive; its routine employment in the consulting-room would materially add to the time necessary for examining a patient, and to acquire facility in its use requires about as much practice as that necessary to become at home with the use of the ophthalmoscope. Nevertheless, its importance as an aid to scientific diagnosis is great, and it is believed by some that its introduction will mark a new era in ophthalmology, comparable to that opened by the invention of the ophthalmoscope itself. In the December number of the *British Journal of Ophthalmology*, Mr. Harrison Butler gives an account of a special week's course on the subject, held at the University Eye Clinic at Zurich by Prof. Alfred Vogt, who has also published an atlas of slit-lamp microscopy. It can hardly be expected that the practical clinical discoveries from the new method can be very striking as yet, but Vogt claims that the earliest clinical sign of sympathetic ophthalmia is the appearance of clusters of cells in the aqueous which can only be seen by this method. Perhaps the most promising field of discovery is the lens, a complete section of which can be illuminated by this method, displaying the exact localisation of opacities. So far English ophthalmologists have been somewhat behind their continental colleagues in taking up this subject, but the interest shown in the method at the meeting of the Ophthalmological Section of the Royal Society of Medicine, reported on p. 231, is encouraging. At this meeting drawings of the appearances seen were shown by Mr. Butler and by Mr. Basil Graves, a Lang Research Scholar. For examining the fundus of the eye the slit-lamp is only available when combined with a contact lens which abolishes the refraction of the cornea, a method which has been worked out by the German ophthalmologist Koeppe, who employs a linear magnification of 80,[2] but which is not practicable at present for every-day clinical work.

[1] Brit. Jour. Exp. Path., 1923, iv., 247.
[2] See THE LANCET, 1920, ii., 1310.

THE CONTROL OF TUBERCULIN.

WHATEVER other effect, for good or for evil, tuberculin may produce when injected into the human or animal body, it certainly does produce tolerance of itself. In the case of the human subject patients have received as much as 1 c.cm. or more of Koch's old tuberculin week by week for months or years without perceptible reaction, and in the case of cattle this tuberculin tolerance has been put to improper use. Pedigree cattle are not allowed to enter many countries unless they have passed a tuberculin test to prove their freedom from tuberculous infection; unscrupulous dealers are known to have given preliminary tuberculin injections to infected cattle in order that they may successfully pass the test. The manœuvre has also been tried in order to outwit a stock owner who rightly insists on the test being applied prior to purchase. At the present moment this fraudulent procedure can only be countered by prescribing a period of isolation and quarantine prior to the official application of the tuberculin test. The evil has attained sufficient importance to justify the Federation of Medical and Allied Services in taking action. A resolution was submitted to the Medical Council of the Federation last Tuesday by Prof. F. Hobday, on behalf of the Veterinary Medical Association, to the effect "That the sale of tuberculin and its use for diagnostic or medicinal purposes shall be restricted to members of the medical and veterinary professions." The demand for legislation to bring the sale and use of tuberculin under Government control is supported by the Agricultural Committees of County Councils throughout Great Britain as well as by the National Veterinary Association, but is opposed by the National Farmers' Union. It is felt that the control of tuberculin is the keystone of the whole edifice of the Milk and Dairies Act, for in controlling tuberculin the most dangerous and most frequent contamination to which milk is subject could also be controlled. Under the Coal Mines Act mallein can only be used under strict supervision, and glanders has practically been eliminated in this country. The legislation suggested by the Federation, by doing away with misuse of the tuberculin test, would be a step towards eliminating tuberculosis in cattle and obtaining a tubercle-free milk supply.

AN UNUSUAL CASE OF STREPTOCOCCAL SEPTICÆMIA.

AT a recent meeting of the Medical Society of the Paris Hospitals MM. Cain and Oury[1] reported a case of fatal streptococcal septicæmia in a man aged 32, in whom the lesions were strictly localised in the veins of the right upper arm and left deep femoral vein, and presented all degrees of severity—viz., suppurative phlebitis with periphlebitic abscess on the one hand and more or less old-standing and organised phlebitis on the other. In contrast with the severity and variety of the venous lesions was the normal condition of the heart, liver, and kidneys in spite of the profound intoxication. Histological examination confirmed the clinical findings. The streptococcus had not formed any colonies in the viscera, but was found in them only in the form of emboli, which had not produced any reaction in the neighbouring tissues, and had probably only occurred at the moment of death. The phlebitis constituted the whole disease, and the condition was one of acute venous septicæmia without a known portal of entry, being caused by a streptococcus of attenuated virulence, as was shown by absence of deep lesions in the organs and lack of virulence for animals. Death, which took place after about a month's illness, was due to broncho-pneumonia. Only a few similar cases have been recorded. Renault and Lévy in 1912 reported a case of streptococcal infection with localisation in the veins and small joints which ended

[1] Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris, Dec. 13th, 1923.

in recovery, and Roux in 1919 published a fatal case of prolonged septicæmia, which ran its course in two stages, the first being one of subacute and the second of acute venous septicæmia. The streptococcus is not the only organism which may give rise to primary venous localisations. The typhoid bacillus may produce similar symptoms, as was illustrated by three cases recently reported by Etienne.

THE PATHOLOGY OF ANAPHYLAXIS.

THE symptoms and pathology of anaphylactic shock differ a great deal in different animals. The classical guinea-pig reaction, in which bronchiolar spasm often leads to death by asphyxia, is quite exceptional. There are reasons for thinking that the reaction in the dog is fairly similar to what happens in man. Fatal human cases are quite rare, and have generally not been at all fully investigated. We welcome, therefore, the careful study of anaphylactic shock in the dog, which Prof. H. R. Dean and Dr. R. A. Webb contribute in three papers in the current number of the *Journal of Pathology and Bacteriology* (pp. 51–94), the other contents of which are summarised on p. 237. Dogs, like men, are rather insensitive. A certain number show no symptoms on receiving the second dose of foreign protein (in this case horse serum), and only a small proportion die. Symptoms of shock, if present at all, come on at once; the animal vomits and lies down with general muscular relaxation. This does not often last more than half an hour, after which signs of recovery are seen. Recovery may be permanent, or a second period of collapse with great weakness and stupor may supervene, which may end in death or last for several hours, after which the animal slowly recovers. The most obvious anatomical change observed is an extreme congestion of the liver and gall-bladder. The liver swells very much and becomes deep purple, the engorgement being due to a distension of the sinusoids with hæmorrhage between the liver-cells; in severe cases the liver-cells themselves show degenerative changes and necrosis of extraordinarily rapid onset. In more than half the animals cardiac hæmorrhages were found, which in several instances involved a branch of the auriculo-ventricular bundle, but there is no evidence that these contributed to the symptoms or the fatal result. In a few instances hyper-distension of the lung alveoli was found with hæmorrhage; in the other organs no gross changes were observed. The changes in the blood were worked out in considerable detail. In both normal and sensitised animals an intravenous injection of horse serum leads to a temporary concentration of the blood. In sensitised animals this is followed by a much greater and more lasting rise in the red corpuscles per cubic millimetre and the percentage of hæmoglobin, due, doubtless, to the passage of plasma into the tissue spaces, and accompanied, curiously enough, by a fall in the colour index and the appearance of large numbers of nucleated red cells in the peripheral blood. Simultaneously with the onset of shock the blood everywhere becomes extremely venous, and this continues in spite of vigorous artificial pulmonary ventilation. The mechanism of this is quite obscure, unless it be an obstruction to the exchange of gases in the lungs by an exudation of plasma into the walls of the alveoli, but the authors attribute to the defective oxygenation of the central nervous system a main share in the production of the lasting and sometimes fatal symptoms. The immediate symptoms are caused by a fall of blood pressure, largely due to the loss of effective circulating blood in the liver. Another blood change, better known from previous work, is the leucopenia which follows immediately after the serum injection and lasts half an hour or so, to be succeeded by a marked leucocytosis. An exemplary analysis of the phenomenon shows that it is due to the polynuclear cells being caught in the lung capillaries.

PNEUMOCOCCAL INFECTION WITHOUT PNEUMONIA.

AT a recent discussion of the Manchester Pathological Society the view was expressed[1] that lung infection with the pneumococcus of pneumonia is an air-borne infection and not blood-borne. Experimental proof of this view is afforded by the occurrence of cases in which there is a prolonged, and often severe, infection of the blood, involving close contact between the lungs and the infecting pneumococcus, and yet pneumonia does not occur. Such a case has been recorded by Dr. A. R. Felty and Dr. C. S. Keefer,[2] of the Biological Division of the Medical Clinic, Johns Hopkins University and Hospital, who preface their account of it by stating that while the pneumococcus is frequently found in the blood-stream during lobar pneumonia, as is shown by the fact that 25 per cent. of Cole's cases gave positive cultures, pneumococcæmia in the absence of a primary pneumonia, with or without subsequent involvement of the lungs, meninges, endocardium, or joints, is much less common. They record an illustrative case in a previously healthy woman aged 22, who suddenly developed severe constitutional symptoms of a general infection without at first presenting any signs of a localised focus. Repeated physical and X ray examination of the chest failed to show any evidence of a pneumonic process, but a generalised blood infection by Type 1 pneumococcus was demonstrated, and its source was determined by cultivation of the purulent discharge from the posterior pharynx and ethmoid cells. On active treatment of the local infection and specific serumtherapy rapid recovery took place. The writers allude to similar cases of primary pneumococcus infection, some of which have run a mild course like their own, while others have ended fatally, and lasted as long as one or two months, simulating at first typhoid fever. When metastases did not occur in the joints, lungs, endocardium, or meninges the outcome was usually favourable. In conclusion, the writers emphasise the frequency of a focus of infection in one or more of the paranasal sinuses in these cases of pneumococcal sepsis, and allude to the investigations of Darling who found in a series of necropsies on all types of pneumococcal infections that 92 per cent. showed pneumococcus inflammation of the paranasal sinuses, and four out of five patients with pneumococcal sepsis had pneumococcal sinusitis. This case bears out, in the human subject, the experimental results obtained in monkeys, animals susceptible to pneumonia, in which the introduction of pneumococci into the air-passages causes pneumonia, while their injection into the blood-stream, or subcutaneous tissue, produces a general septicæmia without lung involvement.

[1] THE LANCET, Jan. 5th, p. 25, and Jan. 12th, p. 87.
[2] Journal of the American Medical Association, Nov. 10th, 1923.

NOTIFIED INFECTIOUS DISEASES.—During the week ended Saturday, Jan. 19th, there were notified to sanitary authorities in England and Wales the following cases of the commoner infectious diseases: scarlet fever 1501, diphtheria 792, enteric 47, pneumonia 1220; and of the less frequent diseases: puerperal fever 45, cerebro-spinal fever 9, acute poliomyelitis 8, acute polio-encephalitis 1, encephalitis lethargica 18, continued fever 1, dysentery 8. Of small-pox 77 cases were notified from the following areas: Derbyshire 26 (Bolsover 2, Chesterfield 8, Ilkeston 2, Swadlincote 5, Blackwell R.D. 4, Clowne R.D. 1, Shardlow R.D. 4); Durham 1 (Chester-le-Street); Gloucestershire 15 (East Dean R.D.); Leicester 6 (Ashby-Woulds); Notts 27 (Hucknall 10, Kirkby-in-Ashfield 15, Stapleford R.D. 2); Yorks, West Riding 2 (Adwick-le-Street 1, Bolton-upon-Dearne 1). Groups of cases of ophthalmia neonatorum were notified in the metropolitan boroughs of Battersea, St. Pancras, and Southwark 2 each, in Birkenhead 3, Sunderland 2, Bristol 4, Liverpool 9, Manchester 7, Oldham 2, Willesden 2, Newcastle-upon-Tyne 2, Tynemouth 2, Nottingham 2, Stoke-on-Trent 4, Walsall 2, Cannock 2, Croydon 3, Birmingham 13, Sutton-Coldfield 2, Kingston-upon-Hull 2, Leeds 2, Sheffield 7, and Cardiff 3.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LVI.—SQUINT IN YOUNG CHILDREN.

A SQUINT in a young child is of importance not only on account of its unsightly deformity and its association with errors of refraction and defective vision, but also because it is not infrequently an indication of organic nervous disease. This relationship at once suggests the primary classification of strabismus into two main classes—concomitant and paralytic. They have nothing in common, and it is the first duty of the practitioner to decide to which class the case belongs; for one is within the province of the ophthalmologist, whereas the other is the concern of the neurologist. The differential diagnosis is as a rule easy. In concomitant squint the two eyes move together to the same degree, the angle between them remaining more or less constant, nor is there any limitation of movement. If the eyes be alternately shaded the shaded eyes converge or diverge to the same extent. These children rarely complain of double vision. If, on the other hand, there is a paresis or paralysis of one or more eye muscles, the paralysed eye may show a limitation of movement in one direction. The eyes do not move together to the same degree, and if they be alternately shaded it will be noted that the secondary deviation is greater than the primary. Children suffering from paresis of an eye muscle generally, but not always, complain of diplopia. In doubtful cases the best test for children is that recently brought out by Hess, professor of physiology at Zürich. The apparatus is simple, consisting of a black sheet of cloth about 18 inches by 24 inches. To this are attached nine red wafers about half an inch in diameter, arranged in three parallel rows. The child is given a black rod, at the end of which is a green arrow; a red glass is placed before the fixing eye and a green one before the squinter. The child now sees the red wafers only with the fixing eye, and the green arrow with the squinting eye. We ask him to place the arrow on the wafers beginning at the top one of each row. If there be a paresis of a muscle, say of a lateral rectus, he will succeed in locating the wafers on the side opposite to the paralysed muscle, but he will fall short of the middle rows of wafers, and very far short of the row on the side which brings the weakened muscle into play. This simple test is within the capacity of almost any child, and gives us a definite measure of the amount of loss of function. If the result be charted and the test repeated from time to time, a graphic record of the progress of the case is obtained.

If tests show that there is no actual paresis of a muscle we are dealing with a concomitant strabismus, which may be convergent or divergent. Cases in which the deviation is upward or downward are uncommon; a strongly converging eye may turn up, but the treatment of the convergence includes that of the secondary error.

Concomitant Convergent Strabismus.

This type is far more common among the working-class children than in the upper classes. I have no doubt that heredity exerts a powerful influence in the ætiology of squint. In many cases among those who come to my school clinics one parent squints, and in a much larger proportion brothers and sisters are affected. I see no reason to doubt the view held by Javal, Worth, and others, that the essential cause of squint is hereditary lack of development of a fusion centre in the brain. Many children, examined with the amblyoscope and stereoscope, show no sign of any desire for fusion, and in others the faculty is feeble. It is obvious that if there be no desire for fusion the eyes have no directing force towards any given object. Again, if one eye is better than the other from the visual standpoint, that eye will be used for fixation to the entire neglect of the other, which may not only assume a false position but may deteriorate in function. A child is not born with a fully developed fusion faculty, but when it is six months old it has a fair grade of binocular vision. There are many adults who do not squint but who never can get the solid effect with the stereoscope, and often have difficulty in fusing the images from a field-glass. The deciding and ultimate factor in concomitant converging strabismus is generally hypermetropia, since there is an intimate relationship between accommodation and convergence.

In addition to the lack of fusion faculty and to mal-coördination of the neuromuscular apparatus there may be a mechanical element which helps to maintain a convergent squint. This is especially true of squints of high degree which have persisted for some years, for there is a tendency for the conjunctiva and the capsule of Tenon to develop on the inner aspect of the globe only to the extent demanded by the false position of the eye. This factor probably accounts for the failure of many operations and to counteract it some surgeons perform a plastic operation upon the conjunctiva. Again, the external rectus may be a very feeble attentuated structure or the internal rectus abnormally tight and strong. In this case an advancement alone will fail to correct the convergence, the internal rectus must be attacked.

Age of Onset.—During the first six months of life, when binocular vision is not fully developed, the child often shows occasional strabismus, but after this epoch any malposition of the eyes, especially if constant, should awaken suspicion. In most cases the history is that the child began to converge at about 3 years old, after an illness such as measles and whooping cough. The explanation probably is that the debility caused by the disease weakens the muscle-nerve mechanism which was before only just able to overcome the tendency towards abnormal convergence.

Amblyopia.—Frequently the squinting eye has very poor visual acuity, even after the most accurate correction of errors of refraction. Amblyopia may exist in varying degrees; the acuity of the average amblyopic eye is 6/60ths. In some cases it is congenital and may or may not be accompanied by strabismus, but mostly it is acquired, the so-called "*amblyopia ex anopsia*." The explanation is that the child rather than see double has suppressed the image from the errant eye, and constant suppression has resulted in loss of function. Amblyopia develops rapidly in children under 3 years old and it is this complication which makes early treatment essential.

Non-operative Treatment.

There is a strong tendency towards spontaneous cure in concomitant convergent strabismus; probably the majority of squints disappear without treatment. Unfortunately, in many cases the eye "dies cured"—hopelessly amblyopic. Our methods must aim at the prevention and cure of amblyopia and the correction of the deformity. As soon as a baby is seen to have developed a permanent or even frequent squint treatment must begin. The first step in all cases is a careful estimation and correction of any error of refraction. The spectacles which correct the hypermetropia must be worn constantly. In a young child it may be difficult to determine the amount of vision in each eye. In such, if the strabismus is confined to one eye, I assume that this eye is amblyopic and occlude the other eye till the squint alternates from one eye to the other. As soon as I obtain alternation I assume that the eye is not amblyopic and give up occlusion, only to return to it if the strabismus shows any tendency to favour one eye above its fellow. Occlusion must be complete so as to exclude light. Merely to place a blank before the fixing eye is useless. The best way is to sew a pad of Gamgee tissue inside the spectacles, but if this be not sufficient to close the eye, then strapping must be used. As soon as alternation appears it is sometimes useful to put a little atropine ointment into the better eye on alternate days. Babies wear special spectacles

with short sides tied behind the head with ribbon. No child is too young to wear a correction for hypermetropia if he be a squinter, in fact it is criminal to neglect a case in this stage when we have the best conditions for preventing the onset of amblyopia. Older amblyopic children are handled in the same manner, but after 5 years of age the prospects of cure are much less and treatment often fails.

Can we do anything to educate a defective fusion sense? Much has been written and little done in this direction. The main difficulty is that the education must commence early, not later than 3 years old in most cases, and the process at such a tender age is intensely difficult, and demands more patience on the side of both parents and children than we can usually command. The methods employed are outside the scope of this paper. The results from fusion training are very disappointing, success infrequent, and often transitory. Probably those patients who regain fusion would have done so without the training after their visual acuity had been improved by spectacles.

Operation for Squint.

When a squinter has received treatment, for some years in the case of moderate degrees, and for at least a year in any case, operation will have to be considered. I find that the most suitable age for operation is 8. It is generally fairly easy to operate upon a child of 8 under local anæsthesia. Younger children are apt to be troublesome, and older ones still more so. All depends upon temperament and early home training. For the majority I find that a general anæsthetic is not necessary, it adds to the difficulties, and makes it impossible to judge the primary effect of the operation. I instil a few drops of cocaine and then inject a few minims of codrenine or novocaine with adrenalin under the conjunctiva over the muscles to be treated. This gives a painless operation if care be taken not to drag on the muscles with the squint hook.

There is great difference of opinion as to the best operation for squint. In any case, simple tenotomy of the internus should be avoided. It is unscientific and uncertain, and in many cases is followed by weakness of the converging act, and not infrequently by actual divergence of the eye. My own practice is to perform recession of the median rectus and advancement of the lateral. In recession the muscle is separated from its insertion into the globe and sutured to the sclera about 5 mm. further back. In advancement the rectus is separated from its insertion and re-attached to the limbal region.

The results of squint operations judged without optimism are not wholly satisfactory. It is very difficult to get a firm grip for the advancement sutures and not infrequently they cut out on about the third day and the muscle slips back to its old position. Probably about 50 per cent. are completely successful, another 30 per cent. good, leaving about 20 per cent. of poor or bad results. There is a tendency for the completely successful cases to diverge slightly in the course of years, whereas those in which there is a residual squint of about five degrees become parallel. The failures can be dealt with after a reasonable interval by re-operation. I think it a mistake to operate upon both eyes at one sitting. I would rather treat a squint by advancement and recession on one eye than by advancement of both external recti.

Concomitant Divergent Strabismus.

This is not nearly so common in children as the converging variety. When present in young children it is generally of the variety known as neuropathic. It is congenital and associated with complete lack of fusion sense. The only treatment is operation when the divergence becomes unsightly. Older children may suffer from a divergence due to myopia which is cured by the use of appropriate glasses. A blind eye or one with very poor vision often diverges, taking the axis of the orbit, which is, in a sense, the natural position for an eye which is not guided by vision.

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Special Articles.

THE PRESENT PROBLEM OF FOOT-AND-MOUTH DISEASE IN ENGLAND.

BY J. A. ARKWRIGHT, M.D. CAMB., F.R.C.P. LOND.

(*From the Lister Institute, Chelsea.*)

THAT the problem of foot-and-mouth disease is not one that is likely to be easily or quickly solved is evident from the large amount of careful experimental work which has been already done on the subject during the last 25 years. In 1898 Loeffler and Frosch began their long series of observations which have been carried on by them and their successors almost continuously since, on the nature of the virus and methods of producing immunity artificially in domestic animals. A great many valuable observations and experiments have also been made in France by Nocard, Vallée, Carré, and others, as well as in Italy, Holland, and elsewhere. The result of all this work has been that a platform of sure knowledge has been reached, but it cannot be denied that much information is still needed to complete the knowledge of the natural history of the disease, the nature of the virus, and still more to enable proper methods of repulse and attack in the face of epidemics to be devised.

Whilst briefly recapitulating the basal facts which have been ascertained it may be useful to indicate at the same time the chief gaps in present knowledge. The virus can be obtained free from recognisable bacteria or other microbes in a clear watery filtrate after passing it through a porcelain filter, and the original blister fluid may be so potent that when diluted 100,000 times one cubic centimetre is sufficient to infect a susceptible animal. The blood also is infective early in the disease. The virus as examined in the laboratory is rendered inert by a temperature of 60° C. (for five to ten minutes), but weak disinfectants—e.g., 1 per cent. carbolic—do not necessarily destroy it. Uncontaminated virus will keep and remain active in the ice-box for months. The disease can be communicated by scarification, subcutaneous or intravenous injection, or by feeding. Exposure to light or drying has usually rendered innocuous material which has been deliberately contaminated.

Against this positive knowledge must be set the extreme variability in activity of the virus, the tendency for it to die out during experimental passage and, on the other hand, the high degree of infectivity of the spontaneous disease and the readiness with which inanimate objects and contaminated ground appear to be implicated in the natural transmission of the disease. There are no accepted experimental data showing how long and under what conditions straw, litter and fodder, or byres and stalls can retain infection.

No microscopically recognisable organism has at present any plausible claim to acceptance as the cause.

Infectivity of Cases of Disease.—Susceptibility of Different Animals.

As regards the infectivity of living animals suffering from "foot-and-mouth" it is known that, as a rule, the disease can be easily transmitted by wiping the mouth or lips of a susceptible animal with material from a case of disease. It has also been shown by Loeffler that an animal is occasionally capable of passing on the disease to its neighbours in a cowshed after apparent recovery for as long as seven months from the onset of illness. It is believed that the virus may be imprisoned in the horn of the hoof and subsequently be set free in an active condition four months after the attack by the wearing away of the hoof. On the other hand, Vallée has shown reason to think that the period of infectivity during the acute stage is rather brief, but that it begins during the incubation period.

Concerning the susceptibility and liability to carry infection of man and animals in the farmyard, other than cattle, sheep, and pigs, very little has been definitely settled, though Hecker claimed that nearly all such animals, including cats, dogs, rabbits, and fowls, could be infected and the disease transmitted from them to ungulates. Loeffler, without recording many experiments, admitted the possibility of all animals and birds, especially starlings, carrying the infection passively, but he failed to infect rodents and birds, &c.

Immunity.

A great deal has been learnt about the production of active and passive immunity. Though protective serum from horses, oxen, or pigs can be obtained, it is either inapplicable for other reasons or too expensive for general use. Active immunisation by direct infection, "*aphtisation*," is uncertain in its results on account of the difficulty of regulating the severity of the attack or foretelling the duration of protection. Temporary passive immunisation by the injection of the serum of recovered animals may be of great use in the presence of an extending epidemic, especially in connexion with active immunity produced by inoculation immediately with virus from a previous case. The blood of animals taken during an attack has been advocated by French workers as a means of producing an immunising general illness of short duration without local lesions. The great bar to the utility of these various methods is the short duration of immunity even after an attack of disease, when a second attack may occur in so short a time as six months or even sooner. It has also been found by Vallée that one strain of the disease does not always protect against another strain of virus even for a few weeks. Prophylaxis, raising the natural immunity by inoculation of foreign protein, has been advocated as an expedient with a view to modifying the severity of an attack.

Animals Suitable for Laboratory Research.

Closely connected with the question of the susceptibility of rodents, &c., is the choice of animals for research. Loeffler and his colleagues gave no support to the view that rabbits and guinea-pigs could be used as laboratory animals, but in 1921 Waldmann and Pape found that guinea-pigs could be infected with considerable regularity if the inoculation were made on the hairless skin of the metatarsus and that by this means vesicles could be produced there and in the mouth. This discovery was confirmed by Hobmaier, Uhlenhuth, and others, and great hopes were raised that by the easier and cheaper methods of research thus opened up knowledge would be advanced more quickly. The new technique does not, however, appear to have given much advantage so far, though the virus can be kept active by passage through a series of guinea-pigs and remain still infective for large animals. The amount of virus obtainable in this way is not enough for the hyper-immunisation of large animals, and no definite attenuation has been associated with passage in these rodents at all comparable to that in the case of small-pox and vaccinia. Nevertheless, the fact that rodents are susceptible, despite previous failures to infect them, is an important piece of knowledge.

Work in Great Britain.

Turning to work which has been done in this country, the opportunities have been very limited. In the first place "foot-and-mouth" has been a rare disease here in comparison with the state of things prevailing on the continent of Europe, owing to the adoption of the policy of slaughter which has had considerable success, though less effective recently. The result of this draconic measure has been to make serious clinical observation in the field of the disease, its progress, infectivity, and means of spread very limited and experimental study impossible.

When in 1921 the Ministry of Agriculture decided to inaugurate research on foot-and-mouth disease, it was with the especial hope that it would be possible to cultivate the virus and work out a method of immunising animals prophylactically. It was considered necessary that the work should be done entirely on board ship and a disused mine-sweeper and a lighter for animals were fitted up for the purpose. It was not till after the research was over that the method of working with guinea-pigs was published, but in any case experiments with calves, sheep, or pigs were then, as now, an essential to the work. It was necessary not only to maintain a stock of virus, but to make experimental inoculations with very limited accommodation.

Experience soon showed that operations could proceed only very slowly and must be seriously limited in their scope and often brought to a standstill by want of demonstrably active virus. The laboratory was open for work for seven months, from the end of November, 1920, to July, 1921, but for most of that time an active virus was not available. It was found necessary about the latter date to close down the research as the result of the urgent demands for general economy in Government departments together with the impossibility of holding out the prospect of much gain to knowledge in the immediate future under the existing circumstances. This aspect of the venture has been explained by Prof. Robert Muir in a letter to the *Times* of Jan. 14th, who at the same time points out that future research is needed, but must be carried out on land, of course, with careful arrangements for isolation.

As a brief summary of the kind of research which is urgently needed the following lines of investigation may be suggested.

1. Further study of the purified as well as of the natural virus, especially with regard to its resistance to drying and daylight, and its culture.

2. Search for some reliable laboratory method of diagnosis, especially for the recognition of slight cases of disease, whether by inoculation of small animals or by some immunological test.

3. The investigation of the natural means of spread with regard to (*a*) the period of illness which animals are most infective and how long infectivity remains; (*b*) the persistence of the contagion on inanimate objects; (*c*) whether other animals than ungulates—e.g., rodents and birds—become infected naturally or act as passive porters of the virus, and in either case whether they are efficient as agents for the transmission of infection to farm stock.

The Practical Issue.

It is to be hoped that Great Britain will soon again be free from infection and then it will be seen whether the country, the Ministry, and the farmers will have the faith and courage to set up and maintain a proper experimental station on land in a place which can be sufficiently isolated. An easier, if less enterprising and more ignoble path would be to leave the investigation to our enthusiastic French, Dutch, and German fellow-sufferers.

There is a further consideration which should stimulate this country to take seriously the need for investigation of the whole subject here. The problem in this country is not quite the same as abroad. There, where the disease is always present with constantly recurring epidemics, the main flow of energy and hopeful enterprise has been towards devising schemes for prophylaxis by vaccination or serum, and for treatment and cure. But here the main problems are, have been, and will again be, prevention of invasion and avoidance of spread. For these objects an efficient vaccine or serum or both would be an invaluable addition to the armamentarium and might cut short an epidemic when it had started. There may, however, be other means to the desired end more suited to the protection of our insular position. To this end careful study should be devoted to all obscure points in the natural history of the disease, and an investigation into the question of the occurrence of the disease in every likely or possibly implicated animal should be thoroughly undertaken, in addition to inquiries into other possible means of transmission.

MEDICINE AND THE LAW.

A Coroner on Anæsthetics.

Dr. R. L. Guthrie, coroner for East London, recently held an inquest upon the body of a girl 3 years of age, who died while under an anæsthetic after undergoing an operation for ear trouble. The medical evidence was to the effect that death was due to the shock of the operation while under the anæsthetic, and the coroner recorded a verdict of death from misadventure, expressing himself as satisfied that the operation was urgent and properly performed and that the anæsthetic (ether) was properly administered. Nevertheless he is reported to have added observations to the effect that the number of deaths occurring under anæsthetics is "disquieting" or "alarming," and that it is unfortunate that "nothing seems to be gained or learned from them from a medical and surgical standpoint." He added that he believed that "in America the subject has been gone into more fully and that the medical and surgical societies are doing far more than we appear to be doing in this country in that matter." In consequence of the coroner's words the inquest was very widely reported in the lay press, and it is to be regretted that such observations should be made without careful consideration and the fullest possible information, particularly in connexion with a death where the coroner himself was unable to attach blame to anybody, and to which they were consequently irrelevant. In America and in this country the elimination of risks due to the use of anæsthetics is a subject of anxious care to anæsthetists and surgeons alike, and to suggest an invidious comparison between the two countries is unjust and misleading. Meanwhile the public should be reminded that thousands of operations take place daily from which the highest skill of surgeon and anæsthetist cannot exclude the possibility of a fatal ending, but that it is only the fatal endings that come under newspaper notice. They must judge whether such endings are frequent or not, when compared with the number of occasions when anæsthetics are administered. They must also remember that "death under an anæsthetic" is a somewhat loose term. A death after an operation may take place before the patient has recovered from the anæsthetic, and yet its administration may have contributed little or nothing at all to the fatality. A death due to an anæsthetic would be one which would have taken place if there had been no operation, or in which death was definitely traceable in some substantial degree to its administration. Even then it might be a case of taking a known risk as the only possible means of saving a patient's life.

Cancer of the Scrotum in a Mule-spinner: a Test Case.

At the Stalybridge County Court, before Judge H. W. Bairstow, K.C., on Jan. 11th, an application was made under the Workmen's Diseases Act, 1906, which was in the nature of a test case, on behalf of an operative spinner—Harry Whiteley—against the owners of the mill in which the operative worked. The Operative Spinners' Association took up the case, and Mr. E. Wingate-Saul, K.C., appeared for the applicant. The point at issue is whether epithelioma of the scrotum, to which it appears mule-spinners have been particularly liable, is one contracted in the course of their employment, and for which they should be compensated. Mr. Wingate-Saul submitted that the disease which the applicant had contracted was epithelioma of the scrotum, and was caused by mineral oil in the course of his employment. The records of the Manchester Royal Infirmary showed that during the 20 years 1902–22 there were 141 patients treated for this disease, and 69, or nearly 50 per cent., of these cases occurred in mule-spinners; further, that in almost every case the spinners were affected on the left side of the scrotum. In order to find out why this was so, and why mule-spinners were so prone to this disease, medical men visited various cotton mills to study the conditions under which the men worked, and to see the mule-spinners at work. They found that on the machines which the men operated there was a carriage which moved backwards and forwards about three feet above the floor, and this had to be followed by the operators. In front of the carriage was a steel bar, which the medical men noticed was always splashed with the mineral oil used for lubrication of the spindles. Threads which were constantly breaking had to be pieced up by the operator, and as they did this the left side of the body constantly came into contact with the steel bar covered with oil. The temperature of the room in which the men worked was high, and the men wore no clothing beyond a pair of trousers and a shirt. Mr. Wingate-Saul submitted that it was the irritation set up by the mineral oil, combined with that caused by the constant friction against the metal bar, that was responsible for the disease. The disease usually manifested itself by the presence of a small wart which was frequently malignant from the beginning, and the only successful cure was an operation performed in good time. The applicant in the present case discovered about two years ago that he had a small scrotal growth, which gradually increased in size, and for which on August 4th last he underwent an operation. The only question before the court was that of liability. A sample of the oil used on the machine would be shown to be such a mineral oil as was described in the schedule of the Workmen's Compensation Act. Mr. Eastham, K.C., who appeared for the mill-owners, called for the production of the medical certificate upon which the application for arbitration had been based. According to the particulars the certificate was dated March 4th, 1923, and referred to the disease from which the applicant suffered as "epitheliomatous ulceration." The only certificate which Mr. Wingate-Saul could produce was one dated July 18th, which referred to the disease as "epithelioma of the scrotum." Application was made for leave to amend the particulars by an alteration of the date and name of the disease in accordance with the July certificate. It was submitted by Mr. Eastham that the judge had no jurisdiction, on the ground that the action would be based on a certificate which had no existence when the proceedings were started, and also that the right to appeal to the medical referee on the question of the validity of the certificate would be prejudiced. The judge expressed his regret that a case of serious importance to all engaged in the cotton industry should be held up on what he suggested were purely technical grounds. After a long legal argument the case was adjourned sine die in order to give Mr. Eastham an opportunity for appealing to the medical referee over the new certificate. As Mr. Eastham formally objected to the judge's ruling on the question of jurisdiction, it is possible that the case will next be raised in the Court of Appeal.

Illegal "Procuring of Drugs."

Yasukichi Miyágawa, a Japanese merchant, was convicted recently at the Central Criminal Court of "procuring" and doing an act preparatory to procuring 500 lb. of morphine hydrochloride for Miyágawa and Co., a firm at Kobe, Japan, and was sentenced under the Dangerous Drugs Acts of 1920 and 1923 to penal servitude for three years, to pay the costs of the prosecution, and to be eventually expelled from this country. His appeal against this sentence has now been dismissed by the Court of Criminal Appeal. The principal point raised was of some importance; being, briefly, that as the transaction, the subject of the prosecution, consisted in the purchase of the drug in Switzerland for shipment to Japan without any bringing of it to this country, it was not a case of procuring within the Statutes referred to and the regulations made thereunder. In the course of the argument for the appellant the Lord Chief Justice pointed out that the shipping documents for the carriage of the drugs from Marseilles to Japan were sent to England, and that shipping documents had been described as "the key of the warehouse." In

delivering the judgment of the court, Lord Hewart said that the Acts and the regulation chiefly in question (Regulation 3 made May 20th, 1921, under the Act of 1920), if compared, did not support the appellant's contention that the physical bringing of the goods to this country, or the intention to bring them, must be proved before a charge of procuring or attempting to procure could be sustained. The sentence was no doubt severe, but it was impossible to believe that the accused acted innocently.

The Case of Ball v. *Howard.*

An action against a medical man was heard before Mr. Justice Bailhache in the King's Bench Division of the High Court on Jan. 23rd and 24th, damages being claimed on the ground of negligence in the performance of an operation for appendicitis. It was stated that the plaintiff patient requested that a specialist should be called in, but the defendant said that this was not necessary. The plaintiff went on well at first, but complications arose, for which a consulting surgeon, who was called in, performed a second operation, followed by a good recovery. Mr. Bailhache, in giving judgment, found the practitioner's conduct in general to be worthy of the profession of which he was an honourable member, but that contrary to his usual practice and habit, he had committed two serious errors of judgment: (1) In not attending at once to the patient's call; and (2) by going away without leaving proper instructions what to do. The plaintiff having suffered no permanent harm, Mr. Bailhache gave judgment for him with £70 damages and the costs of the action, and judgment for the defendant on his counter-claim of 30 guineas fee with costs of the counter-claim.

The Kind of Person that Kills.

It is regrettable that the matter of legal responsibility enters so largely into the investigation of such terrible acts as the recent murder of two children by their nurse, to the exclusion of the scientific study of the kind of person that kills. Jealousy and anger are common human failings; murder is rare, but we are without detailed life-histories that might give us an understanding of the dispositions which underlie crimes of this nature, though even such histories would constitute only the approach to a subject which involves the fullest investigation of the mind of the criminal. The horror aroused by this deed should not shut out consideration of the mental stress and conflict that led to it, for the murderer's previous behaviour and undoubted love for her victims suggest an exaggeration and distortion of the noblest of instincts. The weapons of modern psychology have enabled us to understand something of the unconscious urgings of the minor delinquent; their application to such cases as this might add to knowledge whilst leaving to society the right to decide whether or how that knowledge should be applied.

TUBERCULOSIS.

Coördination of the Work of Tuberculosis Officers and Insurance Practitioners.

THE Ministry of Health has issued a Memorandum, dated December, 1923, on this subject (Memo. 286). It is a timely exhortation to coöperation, and it gives notice of certain alterations in the terms of service of insurance practitioners who, in the future, must send their initial and periodical reports on cases of tuberculosis direct to the tuberculosis officers instead of, as formerly, to the regional medical officer of the Ministry of Health. The Memorandum pays special attention to the cases in which tuberculosis is suspected but cannot be definitely diagnosed. These cases are almost incredibly numerous and, from the administrative point of view, are very difficult to deal with. Yet their successful handling would probably do more to stamp out tuberculosis than any other single measure. The Memorandum suggests that "it will usually be to the interest of the patient that the case should be referred to the tuberculosis officer, both in order that a second opinion may be obtained on the diagnosis, and in order that there may be no avoidable delay in giving the patient the benefit of any facilities available under the scheme of the local authority for diagnosis, treatment, or general care and supervision." This advice is, on the whole, sound, and it will be still more helpful when the tuberculosis service is staffed only by specialists in tuberculosis and not by medical officers of health who act as part-time tuberculosis officers and who have little or no special knowledge of tuberculosis. The Memorandum also lays down certain rules in order that there may be no doubt as to who is responsible for the treatment of a patient at any particular time. In the past the patient has been apt to fall between two stools, represented by the tuberculosis officer and the insurance practitioner respectively.

The Costs of Residential Tuberculosis Institutions.

A document, which promises to become an annual institution, has been published by the Ministry of Health under date December, 1923. It shows in tabulated form the cost of running the various public institutions for tuberculosis in this country. These tables are guaranteed to provide much disciplinary heart-burning and heart-searching, and they show at a glance that the administration of certain institutions is conducted on much more economical lines than that of others. Indeed, in some cases economy would seem to have been raised to such a high, or reduced to such a low, level (it all depends on the point of view) that it is natural to ask whether efficiency has gone hand in hand with economy. In one column the average number of the staff to each 10 beds is published, and it is noteworthy that at one institution this number is as high as 6·5, whereas in another institution it is as low as 2·3. As for the cost of living, the fluctuations are also great; at one institution the average cost per head for provisions is over 28*s.* per week, whereas at another institution this average is under 10*s.* It is pointed out that the information in these tables may be of substantial assistance in enabling the authorities concerned "to decide whether in a given case the various items of expenditure are on the lowest possible level compatible with efficiency." The publication of these tables should have a salutary effect not only on those institutions where expenditure is excessive, but also on those, if such there be, where expenditure has been reduced to a level incompatible with efficiency.

GYNÆCOLOGY AND OBSTETRICS IN SCANDINAVIA.

THE twenty-fifth anniversary of the Gynæcological and Obstetrical Society of Copenhagen has recently been celebrated by a special number of *Acta Gynæcologica Scandinavica*,[1] to which Danish and Swedish specialists in gynæcology and obstetrics have contributed 17 original articles. Some are of strictly limited interest; a paper on the occurrence of eosinophil cells in the appendix of the fœtus and new-born infant is not calculated to be of interest to many. But several of the papers are of both general and scientific interest, and they show, among other things, how closely Scandinavian gynæcologists are in touch with the outer world.

The Place of Cæsarean Section in Obstetrics.

There are two papers with this heading, and the authors represent opposite schools of thought. Prof. Elis Essen-Möller, of Lund, Sweden, discusses the risks of rupture of the scar of the classic Cæsarean section when the patient is again confined, and he holds that the importance of this risk has been exaggerated. If asepsis is maintained, and linen or silk sutures are used instead of catgut, there should be little chance of a weak scar being left. As for the choice between the classic and cervical sections, he finds that in

[1] Vol. ii., fasc. 3, 1923.

aseptic cases the two operations are about equally safe for the mother and infant; it is not yet possible to decide whether the scar in the uterus is more firm after one operation than the other. In defence of the classic operation he stresses its special advantages in cases of placenta prævia, in certain other emergencies rendering it absolutely necessary to remove the fœtus at once, and in the case of elderly primiparæ. But in cases suspected of sepsis he is not in favour of the classic operation, and of the two alternatives—the transperitoneal and the extraperitoneal cervical sections—he much prefers the former. Even when a case has been definitely septic, he notes that, according to the literature, better results, as far as the mothers were concerned, have been obtained with the transperitoneal than with the extraperitoneal operation. This has surprised him, for he had expected that germs would be more dangerous in the peritoneum than in the connective tissue, and that a phlegmon must be less serious than a peritonitis. At his hospital Cæsarean section has been performed in 132 cases since 1900, the chief indication being disproportion between head and pelvis (95 cases). Of the nine fœtal deaths, seven had occurred before the operation. Another fœtal death was due to congenital malformation of the fœtus, and the remaining fœtal death was due to defective ligature of the umbilical cord, the infant bleeding to death. Thus none of the fœtal deaths could be laid at the door of the operation itself. Among the maternal deaths there was one from peritonitis, one from intestinal obstruction caused by strangulation of a loop of the intestine between a myoma of the uterus and the pelvis, three were due to eclampsia, and one was probably due to air embolism.

The other paper on this subject is by Dr. Viggo Esmann, who seems to find certain objections to the growing popularity of Cæsarean section. In cases of habitual death of the fœtus a few weeks before term, he is in favour rather of inducing premature labour than of performing Cæsarean section. He takes the same line when difficult labour at term is anticipated on account of slight disproportion between the head and the pelvis. In 1916 he gave an account of 23 cases in which premature labour had been induced, and among these cases there were only four fœtal deaths, to two of which prolapse of the cord contributed. Since 1916 he has induced premature labour in 24 cases because he anticipated mechanical difficulties, and of the two infants who died, one was malformed and not viable. All the mothers left hospital in good health. Hence his conclusion that this procedure was more successful as well as more natural than the more radical undertaking of a Cæsarean section would have been.

Treatment of Dystocia Due to Bandl's Ring.

Dystocia due to Bandl's ring has recently been characterised as a figment of the imagination, but Prof. E. Hauch refuses to subscribe to this agnostic teaching and states that since the obstetrical service B of the Rigshospital in Copenhagen was started some dozen years ago, 25 cases of dystocia from this cause have been observed among about 20,000 confinements. In 12 of these cases the diagnosis of Bandl's ring was confirmed by abdominal palpation. This revealed a distinct furrow in the uterus which, in one case, was so marked as to give the uterus an hour-glass shape. In the rare cases in which this condition is diagnosed early, he is in favour of giving morphine and waiting for at least an hour in the hope that the contraction may pass off. He adds the warning that the morphine may render the infant oligopnœic at birth, artificial respiration being necessary for some time. In most cases, however, matters have proceeded so far that it is necessary to terminate labour as soon as possible, and the course to be followed must depend on whether the infant is already dead or not. In the former case, forceps may be applied or perforation and basiotripsy performed. Another procedure is decapitation with version and extraction. If, however, the infant is still alive, and the case is not already septic, the best procedure is transperitoneal cervical Cæsarean section. If this operation is contra-indicated, an attempt should be made to bring down an arm and apply forceps.

Kielland's Forceps.

The arguments for and against the use of Kielland's forceps are discussed by Dr. Oscar Horn, who has used them in 70 cases. He also summarises the bulky literature on the subject. He naturally finds that the authorities who have used these forceps extensively are greatly impressed by their superiority over other forceps, whereas the opponents of the Kielland forceps have either not used them at all or only seldom. Dr. Horn concludes that Kielland's forceps undoubtedly require a more accurate topographical diagnosis as well as more practice than the older and simpler forceps, but when these two conditions are fulfilled, Kielland's forceps may be most helpful in cases of difficult labour. He had only one maternal death (pulmonary embolism on the fourteenth day) among his 70 cases, and only six fœtal deaths. When he first began to use these forceps, he fairly often found a clear-cut mark close to the external canthus of one eye, but during the last few years he has not seen this mark. In three or four cases there was slight transitory facial paresis, but only in one case did it last as long as eight days.

Diagnosis of Pregnancy by the Induction of Glycosuria.

Dr. F. Jensen traces the development of these tests for pregnancy since 1920, when Frank pointed out that the administration of 100 g. of grape sugar by the mouth on an empty stomach provokes glycosuria in pregnant women but not in others. Subsequently two other tests have been devised, both of which also depend on the fact that the capacity for assimilating carbohydrates is reduced in pregnancy. One of these tests, associated with the names of Joseph and Kamnitzer, consists of injecting 2 mg. of phloridzin, which provokes glycosuria in the pregnant but not in others. The other test, that of Brinitzer and Roubitschek, consists of inducing glycosuria by an injection of adrenalin after 10 g. of grape sugar have been given by the mouth. Dr. Jensen has worked with Frank's test, which he has modified, and instead of giving 100 g. of grape sugar in every case, he gives 1 g. for every kilo of body-weight. He comes to the conclusion that though the blood-sugar examinations render this test tedious, and at present suitable only for hospital practice, it is remarkably trustworthy, giving useful information in cases of threatened abortion as to whether the fœtus is dead or alive. The phloridzin test may be easier, as it is not necessary to carry out blood-sugar examinations, but only when it is negative is its evidence of value.

The Ultimate Results of Menge's Hysterorrhaphia.

Dr. W. Ottesen, of the Diakonissestiftelsens Hospital in Copenhagen, has investigated the subsequent fate of the patients on whom Menge's hysterorrhaphia was performed in the period 1909–20. He succeeded in tracing 55, 40 of whom were re-examined in his own hospital, 10 were re-examined elsewhere, and 5 sent a written report of their health after the operation. Among the 50 who were medically re-examined, there were only two showing a definite relapse, and in neither of these cases was the uterus so much retroflexed that its fundus lay at the bottom of the pouch of Douglas. It was also found that subsequent pregnancies and labours had not been disturbed by this operation, the technique of which was described in 1904.[1]

Spurious Perforation of the Uterus.

Dr. H. Wulff records a remarkable case which may bring some consolatory reflections to obstetricians who have pleaded guilty to perforating the uterus while curetting it for an abortion. Dr. Wulff's patient was a married II-para, aged 39, who suffered from incomplete abortion in the eighth to the tenth week of pregnancy. Examination under ether anæsthesia showed the

[1] Centralblatt f. Gynäkologie, No. 21, 1904.

cervix to be soft, the external os admitting the tip of one finger. The body of the uterus was anteflexed, anteverted, freely movable, and very soft. Dilatation was started with Hegar's No. 12. Some difficulty was experienced with Nos. 16, 17, and 18. Dilatation proceeded somewhat more easily with the larger numbers, and was continued up to No. 26. A curette was now introduced to a distance of 14 or 15 cm., and some placental tissue was removed. It was suddenly found that the curette could pass a distance of 23 cm. without encountering the slightest resistance in various directions. On bimanual examination the uterus was so soft as to be hardly palpable. Perforation of the posterior wall of the uterus was diagnosed, and hysterotomia anterior vaginalis was undertaken. It was found that the cervix had not been injured, and when a finger was introduced into the uterus, its relaxed walls could be felt definitely contracting. The fœtus and some placental tissue were removed, and the interior of the uterus was carefully explored by palpation. At no point could any perforation be found. Though the patient's recovery was delayed by protracted fever, a malodorous vaginal discharge, and pneumonia, there were no signs of peritonitis, and she was ultimately discharged as cured, with satisfactory involution of the uterus and mobility of its appendages. Dr. Wulff assumes that this was a case of relaxation of the uterus and not of perforation, but he admits that, not having removed the uterus for examination, he cannot swear to its freedom from a perforation.

This special number of *Acta Gynæcologica Scandinavica* also contains an account, by Dr. J. Fog, of a case of considerable medico-legal interest. It was that of a female infant, found alive on a railway line, 10 minutes after an express train had passed. Though both parietal bones were fractured, death did not occur till six hours after the infant was found. The mother had evidently been overtaken by precipitate labour while in the lavatory of the train. This and many other papers make the anniversary number of this journal interesting reading.

SWITZERLAND AND THE OPIUM CONVENTION.

(FROM OUR OWN CORRESPONDENT.)

AT the last assembly of the League of Nations Switzerland was severely criticised by Dame Edith Littelton, the British delegate, for not having yet joined the Opium Convention. As a matter of fact, the Convention was signed in 1913 by the Swiss Minister at The Hague, but it was never ratified by the Federal Parliament. The reasons for this failure are several. One is constitutional. Legislation on general hygienic matters belongs to the cantons. The Federal Government cannot on its own power regulate the production and traffic of certain drugs. This belongs to the sphere of the different cantons. This constitutional difficulty was the cause that the question was allowed to sleep. As the drug-habit is practically unknown in Switzerland public opinion did not take much interest in the Opium Convention. On the other side there was the opposition of certain chemical industries which feared a considerable damage through the regulations of the Convention. Naturally in a small country like Switzerland the control would be much more effective than in a country with vast colonial possessions. It was feared that while inflicting an enormous damage on one of our flourishing industries the ultimate scope of the Convention would be frustrated by the Great Powers tolerating drug-production on a large scale in their colonies. This lack of confidence found recent expression by Dr. A. Jaquet, professor of pharmacology at the University of Basle. Prof. Jaquet writes:—

"Whoever studies the question since the opium wars cannot deny that this is a great enterprise of international hypocrisy; the States interested in opium production and opium traffic are hiding their fiscal interests under a humanitarian cover. The Opium Conference of Shanghai and the Conference at The Hague of 1911 were summoned with the definite object to suppress with all means the production of and traffic with opium. With time this object vanished in the background as the States interested in the opium commerce formulated so many conditions for their coöperation that the war against the opium pest become more or less illusory. Instead, the Conference concentrated its efforts more and more on the regulation of production and traffic of the alkaloids of opium and of cocaine with the object of curtailing both. . . . I am of opinion that it would be best if each country would deal separately in combating the misuse of morphia and cocaine without taking refuge in an International Convention of which the great would take but small notice and which would crush the small."

I have quoted these words of an impartial observer. His views are shared by many Swiss not in the least interested in the chemical trade. In the last years, however, opinion is coming round in favour of a speedy ratification of the Convention. This change is probably due to the influence of the League of Nations on the Opium Commission. The Federal Council has lately been strongly attacked both in the press and in Parliament for moving so slowly in this matter. Under this pressure the Federal Council has prepared a Bill on narcotic drugs which will shortly be submitted to Parliament. When this Bill has become law the Convention can be signed. Waiving some constitutional scruples the Government bases the Bill on a paragraph in the constitution empowering the Federal Council to take legislative action for combating epidemic diseases. The Bill, which is dated Dec. 12th, 1923, provides for the supervision of import, export, production, manufacture, storage, purchase, sale, and distribution of the following drugs: opium in all its forms, morphia and its salts and all preparations containing more than 0·2 per cent. of morphia; heroin, its salts and preparations containing more than 0·1 per cent. of heroin; coca-leaves; cocaine, its salts and preparations containing more than 0·1 per cent. of cocaine. Production of and trade in these drugs are only allowed with a Government licence. Export to other countries which have signed the Convention is only granted if the addressee has a licence for his respective country. This Bill may be taken as a clear indication that the Swiss Government intends to carry out loyally and scrupulously the provisions of the Opium Convention.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Delhi: National Baby Week.

IMMENSE activity is being shown throughout India in connexion with a National Baby Week which is being held in all parts of the country during the third week in January. The "Week" is celebrated at Delhi so as to coincide with the meeting of the Legislative Assembly, and an effort is being made to direct the attention of India's new legislators to the appalling loss of human life which is going on throughout the Peninsula. As is well known, on an average 400 babies out of every 1000 born alive die before they complete their first year in the great Indian cities, and the rate is often much higher.

With a view to preventing the outbreak of plague in Delhi, the Public Health Commissioner with the Government of India has worked out a scheme for intensive rat destruction and the closing down of existing grain stores and their replacement by rat-proof buildings, but although the municipality is willing to provide half the cost of the proposed measures their execution is held up for want of help from the Government.

The recently founded University of Delhi, at which the Inchcape axe is levelled, issued its first report at Christmas. The report forms an excellent apologia for the University's existence, but there is already a flourishing university at Lahore, less than 300 miles away.

Lahore: A Professional Tax on Doctors.

The Lahore Municipal Committee recently proposed the imposition of a professional tax on medical men. As a protest against this measure a largely attended meeting of medical men was held in the city on Dec. 23rd, out of which a committee was appointed to initiate propaganda against the tax and to secure its withdrawal by the Lahore Municipality. It was pointed out that the only two callings which are affected by the proposed tax are the legal and the medical professions, and that if the scheme is carried out medical fees will have to be raised and the public may resort to the large number of quacks practising in the city whom the tax will not affect.

Calcutta: The Exhibition.

At the Calcutta Exhibition, open until the end of January, an exhibit of great interest is a chart by Dr. C. A. Bentley among the official exhibits of the Bengal Public Health Department. "The graph of prices and mortality of each district," he writes, "shows that the seasonal course of prices (of rice) is in all probability the main factor determining the peculiar seasonal mortality curve observable in Bengal, which differs markedly from that of the other provinces." It is clear that in Bengal measures aimed at restricting the prices of agricultural production may be fraught with the very gravest consequences to the health and welfare of the population whose prosperity is almost wholly dependent upon two factors—the general character of the harvest and the monetary return obtained from the sale of crops. If rice fetches a good price the mortality is low and vice versa.

For the establishment of a Pasteur Institute in Calcutta representations are being made to the Governor of India by the Bengal Chamber of Commerce. The nearest anti-rabic institute to the second city of the Empire is at Shillong, and as over a thousand patients were sent there from Bengal last year, it is difficult to resist the claims of the premier Presidency to an institute of its own.

Delhi, Jan. 11th.

SECRET REMEDIES:

FORMULAS DISCLOSED BY THE MAKERS.

PATENT medicines sold in Italy must have their composition stated on the label, and although the formula given may not be always the right one, it is of interest to learn the composition of some well-advertised British and American specialties as "disclosed" by the makers themselves. Of 62 such formulas, 10 were found to be practically identical with those given in "Secret Remedies."[1] 14 others differed materially from the B.M.A. analyses. The remaining 37 patent medicines were not mentioned in these publications. Quantities are given in grammes or cubic centimetres unless otherwise stated.

Formulas not Found in "Secret Remedies."

Albert's Grasshopper Pills.—Aloë barb., 0·12; Colocynth, 0·04; Jalap res., 0·02; Pulv. zingiber, 0·006; Sapo dur., 0·03.

Albert's Grasshopper Ointment.—Ol. oliv., 30; Ol. palm., 180; Res. coloph., 270; Cera flav., 60.

Allen's Foot-Ease.—Acid. salicyl., 5; Acid. boric, 45; Magn. silic., 50.

Angier's Throat Tablets.—Pulv. cort. ulm. fulv., 1·0; Extr. glycyrrh., 0·02; Extr. tussilago farf., 0·03; Paraff. liq., 0·15.

Antexema Granules.—Calc. sulphid., 0·06.

Battle's Bromidia.—Chloral hydrate, 15 per cent.; Pot. brom., 15 per cent.; Extr. hyoscyam., 0·12 per cent.; Sacchar, 15 per cent.; Syr. aurant., 15 per cent.; Extr. glycyrrh., 5 per cent.; Aq. aurant. cort. ad 100 per cent.

Battle's Iodia.—Extr. liq. Stillingio sylvat., Helonia lut., Pimpinella saxifraga., Menispermium offic., part. equal. ad 125·0; Pot. iod., 7·5; Ferr. pyrophosph., 5·0.

Bell's Pa-pay-ans.—Papain, 0·06; Carb. veget., 0·06; Sod. bicarb., 0·06; Ol. menth. pip., 0·002; Ol. gaulther., 0·002.

Bristol's Pills.—Aloë soc., 0·06; Pulv. rhei., 0·05; Pulv. scamm., 0·03; Sapo dur., 0·02; Syr. simpl., q.s.

Cascarets.—Extr. casc. sagr. ("rendered non-bitter"), 0·12; Extr. glycyrrh., 0·25; Ol. anis., Ol. menth. pip., Pulv. acac., Sacch. alb., q.s.

Collis Browne's Chlorodyne.—Chloroform, 6·0; Molasses, 25·0; Extr. glycyrrh., 12·0; Morph. hydrochlor., 0·50; Ol. menth. pip., 0·10; Tinct. cannab. ind., 3·0; Tinct. capsic., 1·50; Syr. simpl., 35·0; Alcohol, q.s. ad 100·0.

Cuticura Pills.—Aloin, 0·02; Jalapin, 0·02; Podophyllin, 0·008; Capsicin, 0·001.

Darley's Toothache Plasters (Johnson and Johnson).—Pimento, Piper nigr., Caryophyll., 10 per cent. of each; Rubber solution, q.s.

Elliman's Embrocation.—Acid. acetic (30 per cent.), 180; Ol. terebinth., 300; Camphor., 20; Ovi vitell., 100; Aq. dest., 400.

Evans's Pastilles ("Special formula for Italy").—Ol. pini. essent., 0·01; Menthol, 0·002; Pot. chlorat., 0·003; Sod. biborat., 0·03; Extr. glycyrrh., 0·17; Pulv. acac., Sacch., q.s.

Fellows's Syrup of Hypophosphites.—Mang. hypophosph., Pot. hypophosph., Sod. hypophosph., Ferr. hypophosph., of each 0·009; Calc. hypophosph., 0·0005; Quinine, 0·003; Strychnine, 0·0011.

Foster's Backache and Kidney Pills.—Pot. nitr., 0·024; Ginep (? juniper), 0·005; Uva ursi, 0·008; Tereb. venet., 0·024; Excip., q.s.

Foster's Digestive Pills.—Podophyllin, 0·011; Leptandrin, Extr. hyoscyam., Aloin, of each, 0·008; Rad. (?) jalap, 0·004. "With tonics and laxatives."

International Chemical Co.'s Bisuroids.—Each tablet contains phenolphthalein, 0·135.

Ecorces d'arémone.—Sapo moll., 75; Glycerin, 25; Pot. iod., 15; Sod. biborat., 1; Citral., 2; Aq. dest., 88.

Fosfiron.—Ferr. nucleophosph., 0·06; Calc. glycerophosph., 0·3; Cinchona alkaloids, 0·05; Caffein, 0·03.

Kassium Extract.—Extr. "cassium lign.," 0·02; Rad. gossyp. barb., 0·04; Calc. glycerophosph., 0·15; Ferri glycerophosph., 0·03; Ol. anisi, 0·0006; Excip., q.s.

Lactopeptine Powder.—Lactose, 40 oz.; Pepsin, 8 oz.; Pancreatin, 6 oz.; Diatase, 4 dm.; Acid. lactic., Acid. hydrochlor., of each, 5 fl. oz.

Langdale's Cinnamon Tablets.—Ol. cinnamom., 0·25; Pulv. acac., Sacch. alb., q.s. Coloured with carmine.

Langdale's Essence of Cinnamon.—Ol. cinnamom., 30; Tinct. cinnamom., 30; Alcohol (90°), 54.

Marshall's Cigarettes.—Lobel. inflat., 20; Datur. stramon., 55; Piper cubeb. 20; Pot. nitr., 5.

Naldire's Worm Powders.—Nuc. arec. pulv., 4·0; Jalap pulv., 0·5; Rosmarin pulv., 0.5.

New Skin.—Pyroxylin, 5; Acetone, 50; Benzole, 20; Amyl acetate, 25.

Norton's Pills.—Aloë cap., 0·03; Extr. gentian, 0·12; Ol. camom., 0·02; Pulv. gentian., q.s.

Pazo Ointment.—Zinc oxide, 10; Camphor, 5; Carbolic acid, 1; Balsam of Peru, 4; Extr. hamamel., 6; Cera flav., 4; Adeps benz., 70.

Reudel's Bath Saltrates.—Magn. carb., 0·005; Calc. carb., 0·005; Pot. carb., 0·00125; Calc. sulphat., 0·0025; Sod. chlor., 0·0012; Lith. carb., 0·00005; Sod., biborat., 0·10; Sod. bicarb., 0·305; Sod. carb., 0·50; Hydrogen sulphid., 0·025; "Baregine," 0·025; "Oxygenated Salts," 0·03; Radio-active substances, traces; essent. aromat., q.s.

Roche's Embrocation.—Ol. caryophyll., Ol. succini., Ol. limon. of each, 15; Ol. olivæ, 55.

St. Jacob's Oil.—Ol. terebinth., 60; Ether sulph., 25; Camphor, 10; Rad. anchus, 0·25.

Salrads, Concentrated (*Tokalon*).—"The active constituents of rhamnus purshianus, ginger and gentian," with Caffeine, 0·30; Lithia, 0·5; and Alcohol, 2·5 per cent.

Scott's Emulsion.—Ol. morrh., 44; Glycerin, 16; Sol. calcii hypophosph. (1·25 per cent.), 20; Sol. sod. hypophosph. (0·625 per cent.), 20; Alcohol, tragacanth, Ess. oils, q.s.

Smedley's Paste.—Pulv. capsic., 4; Adeps pur., 60; Rad. anchus., 1.

Winter's Nature and Health Restorer.—Pulv. rhei, 0·06; Podophyllin, 0·001; Aloë, 0·06; Capsicum., 0·0005; Menth. puleg., 0·02; Extr. senn., 0·06; Menth. sativ., 0·02; Pulv. glycyrrh., 0·005.

Formulas Differing from "Secret Remedies."

In the following list the ingredients are given, first as stated on the Italian label, secondly (in parentheses), as stated in "Secret Remedies." Present but quantity not determined is denoted by n.d. A dash implies that the ingredient is not mentioned in one case or the other. As before, quantities are given in grammes or cubic centimetres unless otherwise stated.

Antipon.—Alcohol, — (0·4 per cent.); Acid citr., 9 (grs. 39·3); Syr. simpl., 10 (—); Coccus cact., 1 (n.d.); Aq. dest., 100 (ad 1 oz.).

[1] British Medical Association, 1909 and 1912.

Bishop's Varalettes.—Lith. citr., 0·12 (n.d.); Piperazin, 0·01 (n.d.); Sod. bicarb., 0·20 (n.d.); Acid. tart., 0·15 (n.d.).
Carter's Little Liver Pills.—Aloin, 0·020 (n.d.); Jalapin, 0·020 (—); Podophyllin, 0·008 (n.d.); Capsicin, 0·001 (—); Pulv. glycyrrh., — (n.d.).
Cadum.—Zinc. oxid., 20 (11·3); Sulph. (flowers), 5 (8·0); Methyl salicyl., 1 (—); Ol. cadini, 1 (7); Acid. boric, — (3·1); Acid. salicyl., — (0·8); Vaseline, 73 (60); Hard paraffin, — (10).
Doan's Backache and Kidney Pills.—Pot. nitr., 0·024 (v); Ol. junip., 0·050 (♏ 1); Extr. uvæ ursi, 0·050 (—); Pulv. fœnugreek, —(grs. 17); excipient, q.s. (grs. 6); f. pil. 1 (f. pil. xx).
Eade's Gout and Rheumatic Pills.—Aloë barb., 0·03 (10 per cent.); Extr. colch., 0·016 (18 per cent.); Pulv. colch., 0·065 (35 per cent.); Excipient, q.s. (37 per cent.).
Guy's Tonic.—Acid. hydrochlor. dil., 0·60 (0·59); Acid. phosph. dil., 0·55 (0·52); Alcohol (95 per cent.), 2·50 (2.27); Inf. gent. co., 10 (40); Tinc. cocci, 0·25 (q.s.); Chloroform, 0·20 (—); Aq. chlorof., — (50); Aq. ad (100), 100.
Holloway's Pills.—Aloes, 0·03 (n.d.); Pulv. zingiber, 0·03 (n.d.); Sapo dur., 0·15 (n.d.); Excipient, q.s. (—).
Kay's Linseed Compound.—Morph. hydrochlor., 0·02 (0·021 per cent.); Chloroform, 1·08 (1·07 per cent.); Alcohol, 4·30 (4·3 per cent.); Extr. ipecac. liq., 0·70 (0·007 per cent. alkaloid); Syr. scillæ, 10·0 (n.d.); Extr. glycyrrh. liq., 10·0 (—); Malt, 20·0 (n.d.); Decoct. sem. lini., 20·0 (n.d.); Ol. anisi, — (n.d.); Syr. tolut., — (n.d.); Syr. simpl., ad 100 (n.d.).
Ovebridge's Lung Tonic.—Syr. marubii, 25 (—); Sy. sem. lini. (?), 25 (—); Acet. ipecac., 7·50 (0·002 per cent. alkaloids); Malt, 25 (n.d.); Chloroform, 0·50 (0·3 per cent); Ol. anisi, 0·10 (n.d.); Ol. caryophyll., 0·10 (—); Ol. menth. pip., 0·10 (n.d.); Alcohol, — (2 per cent.); Capsicum, — (n.d.); Aq., ad 100 (—).
Peps.—Extr. glycyrrh., 25 (25); Sacch. alb., 70 (70); Ol. menth. pip., 0·50 (trace); Ol. anisi, 0·50 (trace); Ol. pini, 1·00 (—); Extr. capsic. liq., 0·20 (—); Acid. tart., 1·00 (—); Extr. tussilago liq., 1·80 (—); Resinous matter, — (0·7); Talc, — (4).
Whelpton's Vegetable (Purifying) Pills. (Whelpton's vegetable pills in Italy).—Aloë soc., 0·06 (n.d.); Pulv. rhei., 0·05 (—); Pulv. scammon., 0·03 (—); Sapo dur., 0·02 (—); Syr. simpl., q.s. (—); Colocynth, — (n.d.); Zingiber, — (n.d.); Gentian., — (n.d.).
Williams's Pink Pills.—Pot. carb., 0·07 (0·66); Ferr. sulph., 0·08 (0·75); Mang. oxid. pur., 0·02 (—); Sacch., 0·03 (0·2); Extr. gentian., 0·025 (—); Aloes, 0·009 (—); Magnesia, — (0·09); Pulv. glycyrrh., — (1·4).
Woodward's Gripe Water.—Sod. bicarb., 1·0 (1·08 per cent.); Sod. brom., 1·0 (—); Ol. anethi, 0·01 (—); Ol. carui, 0·02 (—); Sacch. alb., 20 (20·5 per cent.); Essent. oil, — (0·03 per cent.); Alcohol,—(3·8 per cent.); Aq., ad 100 (—).

The Services.

ROYAL ARMY MEDICAL CORPS.

Capt. M. St. C. Hamilton is placed on the half pay list on account of ill-health.
Lt. A. M. Simson to be Capt and to remain seed.
Temp. Capt. J. A. Marsden relinquishes his commn. and retains the rank of Capt.

RESERVE OF OFFICERS.

Lt.-Col. A. E. Master, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

MILITIA.

Capt. S. Miller to be Maj.

TERRITORIAL FORCE.

Maj. W. Macdonald resigns his commn. and is granted the rank of Lt.-Col.
J. D. M. Cardell to be Lt.
Maj. T. H. Oliver (late R.A.M.C.) to be Maj.

INDIAN MEDICAL SERVICE.

Maj. J. N. Whitamore has vacated the appointment of superintendent of Ambala District Jail. Capt. L. S. C. Roche, M.C., has been appointed Cantonment Magistrate, Amritsar.

DEATHS IN THE SERVICES.

Brig. Surg. Maj. William Creagh, third son of the late Lt. James Creagh, who died on Jan. 18th in his eighty-sixth year, qualified with the diploma of the Royal College of Surgeons in Ireland in 1857. He obtained the L.S.A. two years later, when he also received his first commission in the Army Medical Service. Later he became attached to the Royal Horse Artillery and saw service in the Afghan War of 1878–80, when he was mentioned in despatches and received the medal. He retired in 1882.

Correspondence.

"Audi alteram partem."

YEAST AND CONSTIPATION.

To the Editor of THE LANCET.

SIR,—In an annotation with this title in THE LANCET of Jan. 26th reference is made to the recent work of Dr. L. Gross and it is stated that he "failed to confirm" the mucosal atrophy of the intestine in vitamin A deficiency described by me. The statements made in your editorial columns are, as a rule, so reliable that I feel compelled to point out that Dr. Gross himself does not draw such a conclusion in his paper. Nor can such a conclusion be drawn from his observations. He worked with adult rats of about 200 g. weight and subjected them to a vitamin deficiency for an average of only six weeks. It is well known to everybody engaged in this kind of work that adult rats are much less susceptible to vitamin A deficiency, than young rats. Thus with our homogeneous stock a young rat of 50 g. weight will develop keratomalacia after seven to eight weeks of vitamin A deficiency, while older rats of the same stock weighing 160–180 g. will only develop keratomalacia after five to six months or more. The atrophic change in the intestinal mucosa which I have described occurs in young rats after seven to eight weeks of vitamin A deficiency when they also develop the eye infection which has recently been shown to be associated with a similar atrophic change in one of the paraocular glands. It is therefore not to be expected that the experimental conditions of Dr. Gross's experiment could have shown the atrophic changes which we have observed. Dr. Gross has realised this clearly, for referring to my observations he writes: "I can only assume that the discrepancy in our results is due either to the fact that the rats which he employed were young and growing whereas mine were adult, or to a difference in the length of time on the diet." If Dr. Gross's observations of the effects of a six weeks' deficiency in vitamin A on adult rats were to be taken as failure to confirm the occurrence of an atrophic change in the intestinal mucosa, they should also be taken as a failure to confirm the occurrence of keratomalacia, which is absurd.

I am, Sir, yours faithfully,
W. CRAMER.

Imperial Cancer Research Fund, 8–11, Queen-square, London, W.C., Jan. 26th, 1924.

COLD AND HÆMOPTYSIS IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—In sanatoria for patients suffering from pulmonary tuberculosis cases of hæmoptysis often occur without any predisposing cause. The most common predisposing causes of hæmoptysis are over-exertion, excitement, strain from carrying heavy weights or from excessive coughing, traumatism. These causes do not usually exist in sanatoria, but still hæmoptysis occurs frequently enough to demand some investigation. In a series of 100 cases of pulmonary tuberculosis who have had hæmoptysis during their stay in sanatoria, I have tabulated the times of onset of the hæmorrhage as follows:—

Number of cases which have had hæmoptysis commencing between the hours of 9 P.M. and 7 A.M. ..	57
Number of cases which have had hæmoptysis commencing between the hours of 9 P.M. and 7 A.M., and in which on investigation the hæmoptysis could be put down to some predisposing cause	4
Number of cases which have had hæmoptysis commencing between the hours of 7 A.M. and 9 P.M. ..	39

Patients were all in bed between the hours 9 P.M. and 7 A.M.

It will be noticed from these figures that 57 per cent. of these cases of hæmoptysis occurred without any apparent predisposing cause. These 100 cases

(68 male adults and 32 female adults) were all moderately early cases of pulmonary tuberculosis, the temperature of their sleeping quarters being for all practical purposes that of the open air, but there appears to be no satisfactory explanation why hæmoptysis seems more likely to happen during the period patients are in bed, a point on which Fishberg [1] comments.

I think that sufficient attention has not been drawn to the temperature of the air. Barcroft and Marshall [2] have found that as a result of exposure to cold the volume of blood passed per minute by the heart into the circulation is increased. The amount of this increase varies from person to person. I would suggest that, as a result of the increased volume of blood passing through the lungs, hæmoptysis is more likely to occur during the time of the day when the temperature is lowest. The small arteries and capillaries of the diseased portion of the lung would be more likely to rupture. Owing to the blood-vessels of the lungs not being supplied with vaso-motor nerves, an increase in the amount of blood passing through the lungs will be accompanied by an increase of blood pressure in the arteries. Anders [3] in his investigations has found that hæmoptysis is more common during the months of December, January, and February. My cases have been collected regardless of the season, but from my own observations I have noticed that hæmoptysis is more common among patients suffering from pulmonary tuberculosis during the winter months and during sudden changes of temperature.

In the treatment of hæmoptysis some years ago it was customary to apply ice-bags to the chest or over the affected lung, and to give the patient ice to suck. Through the absence of any good results this method of treatment has been abandoned almost altogether. It would appear from the above that it did more harm than good.

I am, Sir, yours faithfully,

WILFRID SMITH,
Jan. 27th, 1924. Assistant Tuberculosis Officer, Leicester.

GERMAN BATTLE OF THE CLUBS.

To the Editor of THE LANCET.

SIR,—It may interest you to learn that the struggle of German medical men against the Government decree of November, 1923, is not yet finally decided, although the essential part of this decree has been withdrawn. Many of the contracts with approved societies (Krankenkassen) do not terminate until the end of March, and it is not clear what will happen then. An Inquiry Commission now sitting in the Reichs-Arbeitsministerium represents panel doctors and approved societies, with three impartial persons, and has hopes of reaching an understanding. It is curious and unfortunate that the Vereinigte Sozialistische Partei (V.S.P.D.), unlike your Labour Party, is against the panel doctors, who have only the support of the communists, although employed persons generally are on the side of the doctors. Great indignation has been called forth by the fact that the medical men attached to the V.S.P.D. in Parliament have taken the part of the approved societies and are endeavouring to form a society of medical men in Berlin submissive to the will of the approved society executive.

Far-seeing people are convinced that unless some fundamental simplification of the German National Health Insurance is achieved, the system cannot be maintained. Insured persons at present pay 10 per cent. of their income in insurance, while the services rendered by approved societies and disablement insurance offices are far less than before the war. It has been calculated that in the larger towns there is one approved society official for every 500 to 700 insured persons, and to these must be added many officers of the *Versicherungsamt*, of the *Oberversicherungsamt*, the *Landesversicherung*, and the *Reichsversicherungsanstalt*. The enormous sums thus spent in administration are only to be explained by the historical development of the health insurance statutes. It is clear that health insurance can only be maintained by simplification upon the English model, for it is well understood here that the combination of insurance against disablement and disease is a great improvement on the German system.

I am, Sir, yours faithfully,

Berlin-Wilm., Jan. 25th, 1924. ROBERT GÜTERBOCK.

*** Dr. Güterbock's letter was written before he could have seen our summary of his article in the *Medizinische Klinik*. His letter may be regarded as a postscript to the comparative account of English and German Health Insurance given on p. 212 of our last issue.—ED. L.

BLOOD-COMPATIBILITY OF MOTHER AND INFANT.

To the Editor of THE LANCET.

SIR,—In the report of the proceedings of the Liverpool Medical Institute at its meeting on Dec. 20th last, appearing in THE LANCET of Jan. 5th, Dr. Norman Capon, discussing the question of transfusion in a paper on Hæmorrhagic Diseases of the New-born, is reported as having stated that "the mother is generally selected as donor and preliminary grouping is then not necessary." May I be permitted to point out that the implied assumption that the blood of mother and child are necessarily compatible is not justifiable; they may be, and frequently are, of different and incompatible groups. The fact that isoagglutinins do not usually appear in the infant's serum until some months after birth may render it possible to use any blood for transfusion, regardless of its group, without disastrous results in a young child, though, as there is no certainty when isoagglutinins may appear, this procedure cannot be regarded as entirely safe.

I draw attention to this matter because although, for the reasons put forth above, transfusion of an infant with the mother's blood, when incompatible, may be unattended by serious result, this would certainly not be so in the case of an older child.

I am, Sir, yours faithfully,

S. C. DYKE.

St. Thomas's Hospital, London, Jan. 22nd, 1924.

TUBERCULOSIS WORK IN ENGLAND.

To the Editor of THE LANCET.

SIR,—I am sorry to offer any criticism on Dr. Salusbury MacNalty's able article on this subject in last week's issue of THE LANCET, but there is one paragraph I should like to comment on.

Talking of medical progress under the subheading of Artificial Pneumothorax, he says: "... this method of treatment may arrest the disease, or at all events prolong life, and should be practised more frequently than at present. I cannot speak with such eulogy of thoracoplasty, though favourable results are reported in a minority of cases."

His statements are quite true, but the truth is put forth in such a way as to give an impression quite different to what should be conveyed. Dr. MacNalty's "eulogy" of pneumothorax does not inspire, and the results of pneumothorax treatment *are* inspiring. Dr. J. Gravesen (medical superintendent, Vejleford Sanatorium, Denmark) stated at the annual meeting of the British Medical Association at Portsmouth, Tuberculosis Section,[1] that "A comprehensive view of these 211 third-stage cases (2 to 12 years after discharge) shows a lasting positive result of the pneumothorax in 38 per cent. of all cases in which a pneumothorax of any noteworthy extent could be established." Further, that when there were no adhesions, 70·2 per cent. were able to work.

[1] Fishberg: Pulmonary Tuberculosis, 3rd ed., p. 242.
[2] The Effect of External Temperature on the Circulation in Man, Journal of Physiology, vol. lviii., Nos. 2 and 3, Dec., 1923.
[3] Jour. of Amer. Med. Assoc., 1907, xlix., 1067.

[1] See THE LANCET, 1923, ii., 512.

Now look at Gravesen's statistics for thoracoplasty. Out of 105 patients 9 died from the operation; "43 were relatively cured or much improved, 21 improved." Of 69 patients discharged from two to seven years previously, 31, or 44·9 per cent., were fit to work. This, in truth, is a minority, but surely, considering what would have been the fate of these people, who were all advanced cases, this success deserves more "eulogy." Nor are Gravesen's figures exceptional; Bull's results are very similar, and my own experience—on a much smaller scale—has been equally happy.

I am, Sir, yours faithfully,

H. MORRISTON DAVIES,
Medical Supt., Vale of Clwyd Sanatorium.

Ruthin, North Wales, Jan. 28th, 1924.

KETOSIS IN CASUALTY PRACTICE.

To the Editor of THE LANCET.

SIR,—Without wishing to quibble with Dr. O. W. Roberts over terms of nomenclature, I think that a distinction ought to be made between cases of ketosis and those who merely exhibit ketonuria. The former condition is somewhat severe and comparatively rare, whereas the latter, in children, is a common accompaniment of many diverse conditions. No one has yet satisfactorily explained the mechanism of production of ketone bodies in the urine which can occur after anæsthesia, in starvation, in toxæmias and infections, and in certain metabolic explosions. Can any single theory cover all this ground? A comparison of results is therefore of interest and may stimulate inquiry into the ætiology of ketonuria; and I ask you to publish my clinical findings with that end in view.

I examined the urine of 316 in- and out-patients of the Bristol Children's Hospital, and as a control the urine of 112 normal school-children.

Of the 316 cases tested 116, or 36·7 per cent., showed ketonuria.
Of this 36·7 per cent. only 3·0 per cent. were cases of acetone body acidosis or ketosis.
The average age of cases tested was 6·1 years.
The average age of cases of ketonuria was 4·8 years.
Of the cases of ketonuria surgical cases gave 22·8 per cent., medical cases gave 49·2 per cent.; out-patient (total cases before operation) 28·0 per cent.
Of the medical cases 54·3 per cent. occurred in diseases of the respiratory tract; 23·2 per cent. occurred in diseases of the gastro-intestinal tract; 22·5 per cent. occurred in miscellaneous diseases.
The average duration of ketonuria was 2·6 days. There was pyrexia in 78 per cent. of all cases.
After general anæsthesia ketonuria occurred in 100 per cent. of cases.
After 24 hours complete starvation ketonuria occurred in 100 per cent. of cases.
The urine of 112 normal school-children (average age 10·7 years) was tested for acetone bodies. Number of positives, nil.

My findings are in close agreement with those of Dr. Roberts, especially with regard to the irritation of mucous membranes, and the higher incidence in the respiratory diseases was contrary to my expectations. There is undoubtedly some connexion between the catarrhal diathesis or hypersecretion of mucus, so liable to occur in childhood, and the onset of ketonuria; and this view is upheld by the fact that 28 per cent. of children with unhealthy tonsils or adenoids, who were presumably swallowing toxic mucus, were walking about all unknown with varying amounts of ketone bodies in their urine. The lethargy and somnolence of such cases may in part be explained by the action of ketone bodies on the central nervous system. And in addition the coexistence of pyrexia in 78 per cent. of all cases tested would rather tend to show that the outpouring of protective mucus or the stimulation of the anti-body mechanism has something to do with the appearance of ketonuria.

The efficacy of the treatment of ketonuria by sodium bicarbonate is probably due to the fact that that drug not only checks the secretion of mucus, but is a solvent of that already secreted. In passing I should like to repeat my statement which has already been published,[1] that ketonuria is met with in such metabolic upsets as asthma, eczema, migraine, eclampsia, and certain cases of epilepsy.

I am, Sir, yours faithfully,

Wellington, Salop, Jan. 28th, 1924. A. D. SYMONS.

[1] THE LANCET, 1922, I., 627.

THE HARD CASE OF AN UNREGISTERED DENTIST.

To the Editor of THE LANCET.

SIR,—May I ask you to insert my appeal in your estimable journal, so that I may state my case to all medical men, inasmuch as I have been deprived of my means of existence as the result of the new Dental Act?

I have lived in London since 1899 and have been practising as a dentist until 1917, and been respected and appreciated by my patients. I often gave free attendances for an hour or two in the morning to the poor who could not spare time to go to hospitals, and have many times made whole sets of dentures for some poor patients free of charge. During the war until 1917 I gave my services free to soldiers. Then I offered my services to the Government and was refused because I was too old, but as I wanted to do my bit in the war I went to Russia, and entered an army hospital as dentist in 1917, when Kerensky was in power.

Three months afterwards the Soviet came into power, and I was then compelled to serve in the Soviet Army as a dentist, where I went through such hardships and danger as I shall never forget. May I ask your indulgence to describe one incident? In 1919 our hospitals 41 and 48 received orders to evacuate. We were stationed in Orel and were expecting the enemy at any moment. We started to evacuate and had arrived near the town of Kaluga. There the train stopped in the middle of a field on account of the scarcity of locomotives, which were continually returning to bring up other carriages, and our echelon with the two hospitals and the medical staff was standing in the field nearly a month. At the beginning we received ¾ lb. bread per day; a week later we received ½ lb. per day; then we could not get any at all, and all our medical staff went rushing about the cropped fields looking for potatoes and white beetroot. We found very few, however, because the peasants had cleared everything away, having very little for themselves. In that year we could not manage to buy a pound of bread in the villages, so we tried to bake the beetroot, but it was bitter. We had to go a mile for water and carry it to our echelon. We had no tea or sugar, even of salt we only had ¼ lb. per month, and we all slept on bare dirty floors in the luggage wagons. That took place in the middle of October, 1919; it was already cold for the time of year, and snow had fallen. We had only summer clothing, and had to be out amongst all kinds of diseases and dying soldiers. Doctors and their assistants died, for typhus fever and many other diseases were raging, and although not ill myself, my sufferings were necessarily great until I was released from service. I arrived in London with great difficulty in every way and found the place where I now live. I sold everything left to me and I built up a practice, once more getting my old connexion back again.

Now I cannot be registered because I was not in practice in the United Kingdom up till 1921; although I have never committed any offence or had any claims from anybody during my whole life, and am now 70 years of age, yet I am not allowed to earn my living. Where is the humanity in making such a law? Skill is not considered at all. I am sure I am as well up in my profession as others. Why should I be deprived of my living? If I had any other means of making a livelihood I would turn to it. For this reason I appeal to all to have sympathy with me. Please write to the Dental Board to put my name on the Dental Register, so that I may continue to earn my living during the short time which remains to me.

I am, Sir, yours faithfully,

167, City-road, E.C., Jan. 24th, 1924. M. KAMM.

*** This is a very hard case. The Registration Committee has, however, been advised legally that it has no power to register the names of those who have not complied with the statutory conditions. Seeing how Mr. Kamm's default occurred we regret the impotence of the Registration Committee.—ED. L.

Medical News.

UNIVERSITY OF OXFORD: DEGREE DAYS.—Congregations will be held for the purpose of granting Graces and conferring Degrees in the present term on the following days, at 2.30 P.M.: Feb. 16th and March 6th and 20th.

ROYAL INSTITUTION OF GREAT BRITAIN.—On Feb. 5th, at 5.15 P.M., Prof. Arthur Dendy, F.R.S., will give his second lecture on What is Heredity? On Feb. 7th, at 5.15 P.M., Sir William Bragg, F.R.S., will give his first lecture on Crystalline Structure of Organic Substances.

RONTGEN SOCIETY.—A general meeting will be held on Feb. 5th, at 8.15 P.M., in the Institution of Electrical Engineers, Savoy-place, Victoria Embankment, London, W.C. A paper on the Recording of Action Currents in Nerve, with special reference to the use of the Cathode Ray Oscillograph will be read by Prof. H. S. Gasser. The Silvanus Thompson memorial lecture will be delivered by Prof. C. G. Barkla, F.R.S., on April 1st.

Mr. John Wheatley, Minister of Health, has appointed Mr. Douglas Veale, of the Ministry of Health, to be his private secretary, and Mr. A. N. Rucker to be his assistant private secretary.—Mr. Arthur Greenwood, M.P., Parliamentary Secretary of the Ministry of Health, has appointed Mr. H. H. George, M.C., to be his private secretary.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The programme for the month of February includes various special courses as well as a two weeks' intensive course from Feb. 4th to 16th at the North-East London Post-Graduate College (Prince of Wales's General Hospital, Tottenham). The programme will cover the whole day and will include all the general and special departments of the hospital, in addition to a special lecture by a member of the staff at 4.30 P.M. The special Combined Course on Children's Diseases will embrace lectures and clinical demonstrations on medical and surgical diseases of children (including special departments), and there will be two sessions daily from Feb. 4th to the 29th. The following hospitals will participate: Paddington Green Children's Hospital, Royal Waterloo Hospital for Children and Women, Victoria Hospital for Children, and the "Children's Clinic," Western General Dispensary. A further course in venereal diseases will be given at the London Lock Hospitals from Feb. 4th to 29th. The course will include clinical work daily in the wards and out-patient departments at both hospitals with a special lecture by a member of the staff each day. From Feb. 5th to 28th special clinical demonstrations will be given at the London School of Tropical Medicine by Dr. G. Low and Dr. P. Manson-Bahr on Tuesdays and Thursdays, at 2 P.M. The subjects considered will be the more important diseases of tropical countries, illustrated by cases in hospital.

HOUSING IN DUBLIN.—It is just ten years, our Correspondent writes, since a departmental committee of the Local Government Board of Ireland reported on the housing conditions of Dublin. At that time the committee found that one-fourth of the tenement houses of the city were "unfit for human habitation and incapable of being rendered fit for human habitation." At the same time one-fifth of the population were living in one-roomed tenements. Since then there has been no building in Dublin, dilapidation has gone on, and it is likely that control by the sanitary authority has not been more effective. That conditions have not improved is made plain by the medical officer of health for Dublin, Dr. M. J. Russell, in an interview recently given to the press. Owing to the shortage of houses, he says, families are living in houses in which normally animals would not be permitted to live. The overcrowding increases the spread of tuberculosis and persons leaving sanatoriums quickly relapse on returning to their overcrowded dwellings. The infantile mortality is also increased by the housing conditions. Dr. Russell's description of the sanitary accommodation is identical with that given by the committee ten years ago. The closets of the tenement houses are dirty, and there is no attempt at separate accommodation for the sexes. The proportion of the population living in one-roomed tenements has increased from one-fifth to one-third. As most of the tenements in Dublin are in old houses originally intended for one family, each room now housing one or more families, the condition of the woodwork of the floors is beyond description. "One would need," says Dr. Russell, "to see the floors of one of these rooms taken up to fully realise what a fœtid atmosphere must constantly emanate from underneath, and there is nothing so injurious to the health of young children." The corporation cannot venture to close even the worst houses since no other roofs would be available to shelter those dispossessed.

SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH.—This Institute has benefited by donations amounting to £600 made to its research endowment fund. Of this amount £500 has been donated by the British South African Explosives Co., one of the constituent companies of the Nobel industries, and £100 by Sir Harry and Lady McGowan. Sir Harry McGowan is the chairman of the Nobel industries.

UNIVERSITY OF MANCHESTER: THOMAS GRAHAM COLLOID RESEARCH LABORATORY.—Mr. W. B. Hardy, secretary of the Royal Society, opened this laboratory on Jan. 23rd. The foundation of the laboratory, which is the first of its kind, is mainly due to the efforts of a number of business firms which have recognised the importance, scientific and industrial, of this complex branch of physico-chemical investigation. The laboratory has been named after Thomas Graham, Professor at University College, London, and Master of the Mint, who was the founder of the study of the colloidal state of matter. Mr. D. C. Henry will be in charge of the new laboratory.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 25 cases were considered and £299 voted to 23 applicants. The following is a summary of the new cases relieved:—

Widow, aged 67, of F.R.F.P.S. Glasg. who practised in Northamptonshire and died in 1906. Applicant has six children: the married daughters are unable to give monetary assistance but send clothes occasionally. The eldest son, a doctor, has largely supported his mother but is now only able to take locums and has five children of his own; he is only able to allow the applicant 5*s.* per week. The second son allows a similar amount. The applicant has had posts as housekeeper, but owing to her age and ill-health she is now unable to do the work. Voted £18 in 12 instalments.

Widow, aged 80, of M.R.C.S. Eng. who practised in Kent and died in 1881. Applicant mortgaged her property to start her son in business, but he died of consumption in 1915 before he could repay the loan. Then owing to the war she was unable to pay the interest and the mortgagees foreclosed, leaving her penniless. One married daughter has six children and is in reduced circumstances but allows her mother 10*s.* a week, the other daughter is a widow living on a small income and allows 35*s.* a week towards the expense of the applicant's board and necessary attendance owing to her advanced age. This second daughter asks the Fund to help as the allowance she makes is more than she can afford. Voted £26 in 12 instalments.

Daughter, aged 60, of M.R.C.S. Eng. who practised in France and died in 1884. The applicant has a superintendent's post at a G.F.S. Hostel at £50 per annum, but is much overworked and is in danger of breaking down. Voted £10.

Widow, aged 57, of L.R.C.P. Edin. who practised in Sheffield and died in 1911. This lady is in very bad health and has only received £4 10*s.* during the last 12 months by daily catering. This case was brought to the notice of the Fund by the C.O.S., who have been giving the applicant some help to pay her rent, which amounts to 7*s.* 6*d.* per week. Voted £10, and the C.O.S. have been asked to administer the grant.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, K.B.E., M.S., at 11, Chandos-street, Cavendish-square, London, W. 1.

ABERDEEN: JOINT HOSPITAL SCHEME.—An address on the joint hospital scheme was given by Dr. David Lawson, of Banchory, at a meeting of the Aberdeen Rotary Club on Jan. 25th. The scheme had been under discussion for some considerable time—a joint hospital comprising the accommodation of the Aberdeen Royal Infirmary, the Sick Children's Hospital, beds for tuberculosis patients, together with a pathology department and university class-rooms for students, was obviously greatly to the advantage of all concerned over the isolated buildings at present occupied. The site chosen was at Forresterhill, Burnside; 111 acres had been purchased for £35,000. Dr. Lawson went on to say that there was the possibility that a trust would present the site to the infirmary. In discussing the existing arrangements, he pointed out the total inadequacy of beds, not only at the Sick Children's Hospital, but also at the Aberdeen Royal Infirmary. 200 beds were urgently required for the Sick Children's Hospital; tuberculosis patients required 150 beds. The size of the waiting list of patients desiring admission to the infirmary in itself was a clear indication of the inadequacy of the present accommodation. Many surgical beds were occupied by emergency cases. One surgeon stated that 15 of his 22 beds were filled by such cases. Waiting lists steadily grew, and patients had to wait months for admission. This greatly militated against successful early treatment, and early treatment was essential for first-class surgical results. The new scheme provided for 500 to 600 beds for the infirmary. Class-rooms and a hostel were to be provided for students engaged in clinical studies. Prof. Ashley W. MacIntosh commented on the great difficulty in carrying out certain methods of treatment under the existing régime, instancing the treatment of diabetes by "insulin." Sir John Irvin moved a vote of thanks to Dr. Lawson. As chairman of the infirmary directors he also thought that the site would be presented to the infirmary when it moved to Forresterhill, and he understood a purchaser might be found for the present building.

GLASGOW UNIVERSITY.—The Senate has awarded Bellahouston gold medals to the following, who, having gained honours for the degree of M.D. in the year 1923, are, in the opinion of the Faculty of Medicine, worthy of this highest distinction for the excellence of their theses:—

Grace Hay Anderson: The calcium and phosphorus content of the blood in normal and rachitic children. John Norman Cruickshank: Syphilis and pregnancy.

JUNIOR EDINBURGH CLUB.—The fifteenth dinner of the club was held on Jan. 24th at the Boulogne Restaurant, Soho, with Dr. Hugh Paterson in the chair, when there was a large muster of members. Informal dinners are held monthly during the winter, and membership is open to all recent graduates of Edinburgh University. The hon. secretary is Dr. R. Scott Stevenson, 30, New Cavendish-street, W. 1.

THE LATE DR. JAMES HITCHCOCK.—The death occurred on Jan. 27th of Dr. James Hitchcock, of Gerrard's Cross, in his sixty-seventh year. He graduated M.B., C.M. at Aberdeen University in 1880, and was untiring in his devotion to his profession in the field of general practice. He published several articles in various medical journals, among them a prize essay on constipation in the *Practitioner*.

LONDON NEUROLOGICAL CLINIC.—The sixth annual dinner of the medical staff of the London Neurological Clinic (Ministry of Pensions) was held at Princes Restaurant, Piccadilly, on Jan. 26th. Between 40 and 50 past and present members took part. The guests included Lord Dawson of Penn, Lieut.-General Sir William Furse, Sir John Collie, Sir William Willcox, Sir Crisp English, Dr. Harry Campbell, and Dr. T. Beaton. In proposing the health of the Clinic, Dr. Laing Gordon spoke of the confidence of the staff in the future of psychotherapy, their enthusiasm for the cause of mental hygiene, and of the justification for these feelings found in the results of treating 15,000 cases grouped as "neurasthenia" and incipient mental disorder. He paid tribute to the enlightened policy of the Ministry in the care of the "shell-shocked," and to those who had guided it in the establishment and maintenance of the Clinic—in particular, Sir John Collie, Dr. W. A. Brend, and Dr. H. E. Davison. Sir Charlton Briscoe in the chair, in the absence of Dr. Davison, stated that the attendances of pensioners for treatment up to date amounted to over 200,000; and 51,000 had attended for diagnosis and the recommendation of suitable treatment. In replying for the Clinic, Sir Charlton Briscoe traced its growth from its birth in 1917 at Lancaster Gate. The toast of the guests, coupled with the names of Lord Dawson and Sir William Furse, was proposed by Dr. Travers Smith, who pointed out that if the need for psychotherapy amongst pensioners were decreasing, the success of the Clinic made all the more evident the urgent necessity for similar clinics for civilians. Lord Dawson, from his abilities, opportunities, and responsibilities, was generally regarded as the profession's spokesman and referee, and knowing his interest in the subject of team-work the profession would be well content to leave that of psychotherapeutic clinics in his hands. Lord Dawson said: "This Clinic is of value because it sets the pace, embodies an idea, carries it out well. Its repute has gone far and wide. It bears testimony to that widening reasoning which is ever spreading out over our profession and developing a power of working together which we did not exercise before the war." Lord Dawson then entered a plea for more coöperative work within the profession, and pointed out that the danger to be guarded against might be the risk to the individual spirit. "Anything which made us work according to pattern, turned us into officials rather than doctors, would tend to our destruction." Organisation must preserve adequate freedom for the individuality of the practitioner. Apart from its intrinsic value, the Clinic might be well worth preservation as a concrete object-lesson in what team-work should be. It was "an outstanding example, but we have still a lot to learn in the way of settling a clear policy and standing by it." Sir William Furse, speaking as the Regional Director and a layman, expressed his gratitude to the Clinic for its very valuable services to the ex-Service man.

DONATIONS AND BEQUESTS.—Mr. Henry Dixon Phillips, of Ipswich, left £250 to the East Suffolk and Ipswich Hospital; Mr. James Harris, of Swansea, left £100 to the Swansea Hospital; Mrs. Eliza Anne Glass left £500 to the Bristol Eye Hospital and £100 to the Bristol Royal Infirmary, and, subject to certain interests, the residue of the estate of the gross value of £32,636 is left as to one-third between the Bristol Eye Hospital and the Bristol Royal Infirmary.—Mr. George Cholmeley Cattlin, of Hove, who left £89,134, bequeathed £500 each to the Moon Society for the Blind, Brighton, the Society for the Relief of the Widows of Medical Men, Lloyds Benevolent Fund, the Sussex County Hospital, Epsom College, St. Bartholomew's Hospital, the London Hospital; £300 each to the Brighton, Hove, and Preston Dispensary, the Charity Organisation Society, Brighton Branch, the Surgical Aid Society, the Brighton, Hove, and Preston Dental Hospital, the Brighton, Hove, and Preston Throat and Ear Hospital, the Alexandra Hospital for Children, Brighton, and the Sussex Eye Hospital; £200 each to Dr. Barnardo's Homes, Hove Branch, St. Barnard's Home, Hove, the Royal Hospital for Incurables, Putney. The residue of his property, after various bequests and annuities, to the before-named charities pro rata in accordance with the amount of their legacies.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, W.

THURSDAY, Feb. 7th.—4.30 P.M. Papers to be read: J. W. Pickering, D.Sc., and J. A. Hewitt, Ph.D.: Further Experiments on the Action of "Peptone" on Blood, with Notes on the Significance of Surface Phenomena in the Problems of Anaphylaxis and Susceptibility. (Communicated by Prof. W. D. Halliburton.)—L. B. Winter and W. Smith: Studies on Carbohydrate Metabolism. I. Variations in the Nature of the Blood-sugar. (Communicated by Prof. F. G. Hopkins.)—E. C. Grey: The Latent Fermenting Powers of Bacteria. Parts I., II., and III. (Communicated by Prof. A. Harden.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Feb. 4th.

TROPICAL DISEASES AND PARASITOLOGY: at 8.30 P.M.

Paper:

Dr. J. Gordon Thomson: Recent Investigations in Rhodesia in Blackwater Fever.

Communications:

Dr. A. H. Skinner (Hankow): Schistosomiasis Japonica: the Diagnosis of Early and Mild Infections.

Mr. M. L. Treston (Burma): A Case for Diagnosis: (?) Anthrax Bacilli found in the Spinal Fluid in a case of Paralysis of the Lower Limbs.

Cases and Specimens:

Dr. J. B. Christopherson: (1) Cases of Actinomycosis in the Parotid Region from Teheran: (2) Actinomycosis, Granules Stained (from case shown).

Dr. Carlos Franca: The Intermediary Host of Schistosoma Japonicum in Formosa (*Blanfordia Nosophour formosana*).

Dr. Mendoza Gnazon: (1) Bottle Specimen of Papillomatous Schistosomiasis of the Rectum (Philippines); (2) Section from Liver; Ascaris Infection.

Tuesday, Feb. 5th.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)

Cases will be shown.

Paper:

Mr. J. W. Dowden: The Principle of Early Active Movement as Applied to Fractures of the Upper Extremity.

PATHOLOGY: at 8.30 P.M.

Laboratory Meeting at 8.30 P.M. at St. Bartholomew's Hospital.

Demonstrations, &c.:

Dr. R. L. Mackenzie Wallis: Intermittent Cystinuria.

Dr. R. R. Armstrong: Experimental Prophylaxis of Sensitised Pneumococcal Vaccine.

Dr. M. Donaldson and Dr. R. G. Canti: (1) Demonstration of Microphotographic Incubator designed for the Study of the Action of Radium on Tissues growing in vitro; (2) Microscopical Demonstration: Carcinoma of the Cervix Uteri treated with Radium.

Dr. T. H. G. Shore: Demonstration: The Application of Gelatin to Museum Technique.

Dr. H. E. Archer: Demonstration: The Estimation of Blood Urea.

Dr. L. P. Garrod: Quantitative Method of Cultivating Fæces.

Sir Bernard Spilsbury: Demonstration: Rhabdo-myosarcoma.

Wednesday, Feb. 6th.

SURGERY: at 5.30 P.M.

Paper:

Mr. Grey Turner: Some Encouragements in the Surgery of Malignant Disease.

Thursday, Feb. 7th.

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.

Short Communications:

Mr. F. Winson Ramsay: Notes on a case of Normal Pregnancy after Operations for Ectopic Pregnancy on both Fallopian Tubes.

Dr. J. P. Hedley: An Unusual Case of Chorion Epithelioma (with specimen).

Dr. J. D. Barris: Dysmenorrhœa due to Hæmatometra in the Rudimentary Horn of a Bicornute Uterus.

Paper:

Mr. Comyns Berkeley, Mr. E. C. Dodds, and Mr. A. L. Walker: Some Chemical Observation on the Toxæmias of Pregnancy, with special reference to Hepatic Function.

Friday, Feb. 8th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.)
Cases:
Dr. Stanley Melville: Case for Diagnosis.
Dr. C. F. T. East: Case of Morbus Cordis.
Dr. Douglas Firth: Red-headed Albinos.

OPHTHALMOLOGY: at 8.30 P.M. (Cases at 8 P.M.)
Cases will be shown.
Papers:
Mr. Basil Lang: A Modification of the Usual Method of Extraction of Lens in Senile Cataract.
Mr. Malcolm Hepburn: A Classification of Affections of the Choroid.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Feb. 6th.—4 P.M., Dr. S. Vere Pearson: Pulmonary Tuberculosis—Early Diagnosis of the Disease.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEBRUARY–MARCH, 1924.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, Feb. 4th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Hemiplegia, Varieties and Localisation: Dr. Kinnier Wilson.
TUESDAY, Feb. 5th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Paralysis Agitans: Dr. Walshe.
THURSDAY, Feb. 7th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Post-encephalitic Conditions: Dr. Walshe.
FRIDAY, Feb. 8th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Recent Studies on the Vestibular Nerve: Mr. Sydney Scott.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, Feb. 4th.—12 noon, Neurosyphilis. I.: Dr. J. G. Greenfield.
The fee for the Course, including Pathology, is £5 5*s*. For those who hold Perpetual Tickets the fee is £3 3*s*.

COURSE OF LECTURES ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM will be given by Dr. Kinnier Wilson on Wednesdays and Thursdays at 12 noon, commencing Feb. 13th.
The fee for this Course will be £2 2*s*.

Dr. F. M. R. Walshe will give A COURSE OF EIGHT CLINICAL DEMONSTRATIONS, CHIEFLY ON METHODS OF EXAMINATION OF THE NERVOUS SYSTEM, in the Wards at 10 A.M., every Wednesday and Thursday during February. The numbers attending the Course will be limited. Fee £2 2*s*.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, Feb. 6th.—3.30 P.M., (I.) Papilloedema and Optic Neuritis: Mr. Leslie Paton.
The fee for this Course alone is £5 5*s*. If taken in conjunction with the general Post-graduate Course the fee is £3 3*s*. All applications should be sent to the Secretary, Medical School.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W. 1.
MONDAY, Feb. 4th, to SATURDAY, Feb. 9th.—Combined Course on Diseases of Children. Clinical Demonstration and Lectures from 10 A.M. to 4.30 P.M. daily, including the VICTORIA HOSPITAL FOR CHILDREN, the PADDINGTON GREEN CHILDREN'S HOSPITAL, and the ROYAL WATERLOO HOSPITAL.—CENTRAL LONDON OPHTHALMIC HOSPITAL. Clinical Lecture Demonstration every afternoon. Mon., 2 P.M., Mr. Oliver. Tues., 2.30 P.M., Mr. Gibb. Wed., 2.30 P.M., Mr. Neame. Thurs., 2.30 P.M., Mr. Cunningham. Fri., 4.30 P.M., Mr. Williamson-Noble (Pathological).—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars. Clinical Instruction in the Out-patient Department every afternoon from 2.30 P.M. Tues. and Fri., 5.30 P.M., Venereal Clinic.—LONDON LOCK HOSPITALS. Clinical work daily. Lectures at Dean-street as follows: Mon., 5 P.M., Mr. Gibbs: Anterior and Posterior Urethritis. Tues., 2.30 P.M., Mr. McDonagh: Treatment of Gonorrhœa and Its Complications. Wed., 5 P.M., Mr. Juler: The Commoner External Venereal Diseases of the Eye. Thurs., 4.30 P.M., Mr. Abel: Treatment of Acute Gonorrhœa in the Male. Fri., 4 P.M., Mr. Abraham: Treatment of Gonorrhœa in the Female.—LONDON SCHOOL OF TROPICAL MEDICINE. Tues. and Thurs., 2 P.M., Special Clinical Demonstrations.—NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N. 15. Special Intensive Course, first week Feb. 4th to 9th. Demonstration and Cliniques from 10.30 A.M. to 4 P.M. daily. Clinical Lectures at 4.30 P.M. Mon., Mr. Banister: Some Problems in Pregnancy. Tues., Mr. Gillespie: Diagnosis of Intermittent and Chronic Swellings of the Knee-joint. Wed., Mr. Benians: The Present Position of Vaccine-Therapy. Thurs., Mr. Carson: Difficulties in After-treatment following Operation on the Abdomen. Fri., Dr. Crookshank: Pathogeny and Treatment of Migraine.—WEST-END HOSPITAL FOR NERVOUS DISEASES, at 73, Welbeck-street, W. Mon., 1.30 P.M., Dr. Campbell: Facial Paralysis, Neuralgia, and Other Disorders of Peripheral Nerves. Tues., 5 P.M., Dr. Scripture: Speech Disorders in Nervous Disease. Thurs., 1.30 P.M., Dr. E. D. Macnamara: Epilepsy and Other "Fits." Fri., 5 P.M., Dr. Worster-Drought: Encephalitis Lethargica.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Feb. 4th.—5 P.M., Prof. K. Macfarlane Walker: The Internal Secretion of the Testis.
WEDNESDAY.—5 P.M., Prof. C. Max Page: The Surgical Treatment of Osteo-arthritis.
FRIDAY.—5 P.M., Prof. W. Heneage Ogilvie: The Infection of the Upper Alimentary Tract.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Feb. 4th.—10 A.M., Surgical Registrar: Surgical Anatomy. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Bishop Harman: Eye Dept.
TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards. 2.30 P.M., Dr. Pritchard: Medical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 11 A.M., Mr. Simson: Gynæcological Demonstration. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations and Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear..
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 7th.—4 P.M., Mr. Shires: X Ray Appearances in Diseases of the Joints.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Feb. 7th.—5 P.M., Mr. T. B. Davies: Acute Abdominal Pain in Pregnancy.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Feb. 5th.—5 P.M., Dr. Adamson: Streptococcal and Staphylococcal Eruptions.
THURSDAY.—5 P.M., Dr. J. L. Bunch: Tuberculosis.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, Feb. 6th.—4.30 P.M., Mr. P. P. Cole: Inoperable Cancer of the Uterus.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Feb. 4th.—(At the Children's Hospital.) Mr. Dun: Surgical Treatment of Tuberculous Glands.
TUESDAY.—(At the Southern Hospital.) Dr. Sanderson: Intrinsic Cancer of the Larynx and Ear and Nose Cases.
WEDNESDAY.—(At the Northern Hospital.) Dr. Leith Murray: Genital Prolapse.
THURSDAY.—(At the Stanley Hospital.) Mr. A Evans: The Acute Abdomen.
FRIDAY.—(At the Royal Infirmary.) Mr. Guthrie: Foreign Bodies in the Air- and Food-Passages.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
MONDAY, Feb. 4th.—4.15 P.M., Mr. S. R. Wilson: Recent Improvements in Anæsthesia.
TUESDAY.—4.15 P.M., Dr. A. Ramsbottom: Spastic Paraplegia.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURE. (At Whitworth-street West Branch.)
FRIDAY, Feb. 8th.—4.30 P.M., Dr. C. P. Lapage: Rheumatism and its Allied Infections in Children.

ANCOATS HOSPITAL LECTURES.
THURSDAY, Feb. 7th.—4.30 P.M., Dr. G. L. Langley: Early Cardiac Complications of Rheumatism.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES.
TUESDAY, Feb. 5th.—(At the Royal Hospital.) 3.30 P.M., Mr. G. Simpson: Hypertrophy of the Prostate.
FRIDAY.—(At the Jessop Hospital.) 3.30 P.M., Mr. Chisholm: Acute Abdominal Pain in Pregnancy.

Appointments.

DICK, Major C., late R.A.M.C., M.R.C.S., L.R.C.P. Lond., has been appointed Medical Superintendent of St. Mary's Hospital, Paddington.
HOSKIN, T. J., M.D. Camb., M.R.C.P. Lond., Assistant Physician, Royal Free Hospital.
HOWELL, B. WHITCHURCH, F.R.C.S. Eng., Consulting Orthopædic Surgeon to "Brookscroft" Voluntary Infant Welfare Centre, Walthamstow.
MACKENNA, R. W., M.D., Ch.B. Edin., Lecturer in Dermatology, University of Liverpool.

ODDY, H. M., M.B. Oxf., M.R.C.P. Lond., Assistant Physician to the Belgrave Hospital for Children.
WHARTON, J., M.D. Camb., Honorary Ophthalmic Surgeon, Manchester Royal Infirmary.
Surgeons under the Factory and Workshop Acts: GOVAN, G., M.B., C.M. Edin. (Cockermouth); LEGGE, S. B., M.D., Ch.B. Edin. (Shifnal).

Vacancies.

For further information refer to the advertisement columns.

Aylesford, Kent, Preston Hall.—Asst. M.O. £500.
Birkenhead and Wirral Children's Hospital.—H.S. £100.
Bedford County Hospital.—Asst. H.S. £130.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £120.
Bournemouth, Holiday Home for Tuberculous Ex-Service Men.—Res. Med. Supt. £500.
Chesterfield and North Derbyshire Royal Hospital.—Jun. H.S. £150.
City of London Hospital for Diseases of the Heart, Victoria Park, E.—Radiologist.
Discovery Expedition.—S. £600.
Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £250.
Glamorgan County Mental Hospital, Bridgend.—Jun. A.M.O. £350.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Anæsthetist.
Hospital for Sick Children, Great Ormond-street, W.C.—Cas. O. Also Asst. Pathologist. Each £100.
India, Women's Medical Service.—Medical Woman. Rs.550 p.m.
Kent County Ophthalmic Hospital, Maidstone.—H.S. £300.
Leicester Royal Infirmary.—Second Res. Anæsth. £200.
London Lock Hospitals, 283, Harrow-road, W., and 91, Dean-street, W.—Hon. Ophth. S.
London (Royal Free Hospital) School of Medicine for Women.—First Asst. in Obstet. and Gynæcol. Unit. £700.
Lowestoft, St. Luke's Hospital.—Jun. Asst. M.O. £500.
Malay States.—M.O.'s. and Health O.'s. £616.
Manchester Hospital for Consumption, &c.—Res. M.O. £300.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Asst. Cas. O. £100.
Northampton General Hospital.—H.S. £150.
Nottingham General Hospital.—H.S. £200. Also Res. Cas. O. £250. H.P. £200.
Orkney, Parish of Eday.—M.O. £280.
Plymouth, Devon and Cornwall Sanatorium for Consumptives, Didworthy, South Brent.—Res. Med. Supt. £550.
Queen Mary's Hospital for the East End, Stratford, E.—Hon. Asst. P.
Royal Earlswood Institution, Redhill, Surrey.—Jun. Asst. M.O. £250.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Three Hon. Anæsthetists.
Salford Royal Hospital.—Pathological Asst. £260. Also Lady Supt. of Nurses. £250.
St. Marylebone Hosp., Ladbroke-grove, W.—Third Asst. M.O. £300.
St. Thomas's Hospital.—P. to Out-patients.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Cas. O. and Reg. £150.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg., Hon. Surg. Reg., and Hon. Obstet. Reg.
The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Barnet, Herts; Peasenhall, Suffolk; St. Blazey, Cornwall; Crewkerne, Somerset.

Births, Marriages, and Deaths.

BIRTHS.

BURNHAM.—On Jan. 26th., the wife of C. Burnham, M.B., Ch.B., F.R.C.S.E., of a daughter.
CARNEY.—15th Jan., at Errigle, Cootehill, Co. Cavan, the wife of Major P. Carney (late R.A.M.C.), of a son.
REID.—On Jan. 11th, at New Barns, Yalding, the wife of Captain S. D. Reid, R.A.M.C., of a daughter.

MARRIAGES.

COPP—FENTON.—At Holy Trinity, Sloane-street, on Jan. 22nd, Evelyn May, the elder daughter of the late Rev. Charles Copp, Silverton, Devon, to Henry Felix Fenton, Medical Superintendent, Worcester County and City Mental Hospital, son of the late Dr. H. A. Fenton, of Hatfield, Nth. Doncaster.

DEATHS.

BALE.—On Jan. 27th, at 5, College-gardens, London, N., Henry James Bale, Founder and Managing Director of Bale, Sons and Danielsson, Medical Publishers, aged 76 years.
CREAGH.—On Jan. 18th, at Grangewood Lodge, Netherseal, William Creagh, Brigade Surgeon-Major, attached Royal Horse Artillery, third son of the late Lieut.-General James Creagh, in his 86th year.
DE JONG.—On Jan. 18th, from pneumonia, Oscar de Jong, M.B., Ch.B., D.P.H., of Rodney-street, Liverpool.
MACNICOL.—On Jan. 26th, at Queen Alexandra's Military Hospital, Millbank, Major Robert Henston MacNicol, R.A.M.C.
SHULDHAM.—On Jan. 23rd, at Priory-court, N.W., Edward Shuldham, M.D., M.A. Oxf., aged 86.
SMITH.—On Jan. 26th, at Ranelagh-avenue, Hurlingham, John Alexander Smith, L.D.S. Eng., in his 86th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE HISTORY OF PERCUSSION AND AUSCULTATION.[1]

BY SIR WILLIAM HALE-WHITE, M.D., F.R.C.P. LOND.

IN the investigation of disease we doctors probably use percussion and auscultation more than any other means, yet had this meeting been held a hundred years ago it is most unlikely that a single person present would have known anything about them, for they had only come into use four or five years before in France, and Forbes's translation of Laënnec's book was not published in England until 1821.

Leopold Auenbrugger and Percussion.

Percussion we owe to Joannes Leopold Auenbrugger (1722–1809), who studied medicine at the University of Vienna, one of his teachers being Baron von Swieten. Auenbrugger appears to have early shown a talent for observation, and obtained his doctor's degree in 1752. The little book of 95 pages on which his fame rests was first published in 1761; a second unaltered edition appeared in 1763. It is written in Latin, and the pages are so widely spaced that the whole book only contains about 7000 words—that is to say, it could all appear in five or six pages of THE LANCET. It is entitled "Inventum Novum ex Percussione Thoracis Humani ut Signo abstrusos interni Pectoris morbos detegendi." The text consists of 48 sections, each numbered; these are grouped, not into chapters, but into "Observations"; there are 14 such groups. After most of the sections there appears a Scholium or Annotation. Thus:

"OBSERVATION II.

On the Method of Percussion.

§ IV.

The thorax ought to be struck, slowly and gently, with the points of the fingers, brought close together and at the same time extended.

Scholium

Robust and fat subjects require a stronger percussion; such, indeed, as to elicit a degree of sound equal to that produced, by a slight percussion, in a lean subject."

Statements of great importance were that disease exists if the percussion note is different in similar places on the two sides, and if it is on both sides equal but diminished in intensity; that the superficial extent of the unnatural sound in a sonorous region is commensurate with the extent of the morbid affection; that if the same results are obtained both before and behind, on points precisely opposite, the disease occupies the whole diameter of the chest. Corvisart justly says nothing can be clearer, more precise or more true, than the preceding paragraphs. Auenbrugger then tells us that a morbid sound always accompanies a copious effusion of fluid in the thoracic cavity; that such a sound perceived during the course of acute diseases of the chest, occurs most frequently in inflammatory affections—the duller the sound the more severe the disease, the more extensive the dull sound the greater the danger. The ninth observation is entitled "Of the appearances on dissection, in cases in which the preternatural sound of the chest has been observed." These are the following: (1) Scirrhus of the lungs; (2) the conversion of this into an ichorous vomica; (3) a purulent vomica (simple or ruptured), in the pleura, lungs, mediastinum, or pericardium; (4) empyema; (5) Dropsy of the chest in one or both cavities; (6) dropsy of the pericardium; (7) extensive extravasation of blood in the cavity of the pleura or pericardium; (8) aneurysm of the heart. Corvisart's commentary on this is worth quoting: "Of the surpassing importance of a knowledge of these no one can doubt; and when it is considered that percussion—and percussion alone—can make us acquainted with them, we cannot sufficiently applaud those men who have enriched this, the most difficult department of medicine, with a kind of knowledge at once so scientific and satisfactory."

It is strange to see that in 1761 so distinguished a physician as Auenbrugger gathered together all varieties of solidification of the lungs under the one word scirrhus, and that all varieties of cardiac dilatation were included in the phrase "aneurysm of the heart." We have here an indication of the backwardness of medicine at that period, but it is interesting to observe that he knew that a phthisical cavity gives a dull note, and, greatly to his credit, he not only discovered percussion, but also knew from dissection the diseases in which the dull note is given. The remaining observations are occupied with the symptoms of these eight

[1] An abstract of an address delivered before the Midland Medical Society at Birmingham.

conditions. Short as his little book is, it might be much condensed, for Auenbrugger's fame rests on the few paragraphs in which he announces the discovery of percussion, states where in health the note is sonorous, where it is dull, and teaches us in what diseases it is dull.

Reception of Auenbrugger's Work.

There is no doubt that Auenbrugger's work did not fructify until Corvisart published his admirable commentary. This was due to two causes: Auenbrugger was a court favourite and his jealous colleagues would not pay attention to his discovery; also, he did nothing to help the seed to grow. There is no evidence that he was, like Laënnec, a great teacher who by lecture and bedside demonstration was always forwarding his discovery, or that he was a great physician interested in all branches of medicine. He appears rather to have the good luck to hit upon the discovery of new means of diagnosis. As far as we know, only two people of importance took any interest in Auenbrugger's book during his lifetime—namely, Albrecht von Haller and the Leipsic professor, Christian Gottlieb Ludwig. Letters written by Auenbrugger to Haller exist, as also does one of condolence to Haller's son on the death of the great physiologist. But neither of these two famous men did much to further the discovery of percussion. Speaking generally, the discovery fell dead, as will be seen by reference to Neuburger's recent work [2] on Auenbrugger.

In France in 1770 Rozière de la Chassagne published, with a work of his own, "Manuel des pulmoniques, ou Traité complet des maladies de la poitrine," a translation of Auenbrugger's book, but this, too, attracted no attention. But in 1788 Corvisart, having heard of Auenbrugger's discovery, began to practise it. In 1808, a year before Auenbrugger's death, Corvisart published a translation of the "Inventum Novum," praised the method, and added commentaries of his own, so that the little book of 95 pages became one of 440. This remarkable book shows that Corvisart fully understood the art of percussion, and wherever Auenbrugger is correct he is awarded unstinted praise; where his knowledge of medicine is at fault he is corrected. Laënnec was enthusiastic in praise of percussion, saying, "La percussion de la poitrine est, sans contredit, l'une des découvertes les plus précieuses dont la médecine se soit jamais enrichie." Thanks primarily to Corvisart, but largely to Laënnec, Auenbrugger at last gained, not in his own country, but in France, the recognition due to a great discoverer. In Great Britain he was introduced to the profession by John Forbes, who in 1824 published "Original cases with dissections and observations illustrating the use of the Stethoscope and percussion, in the diagnosis of Diseases of the Chest," which book contained a translation of Auenbrugger's original treatise and a selection of Corvisart's commentaries.

Laënnec and Auscultation.

Auscultation was discovered by René Théophile Hyacinthe Laënnec, who was born at Quimper in 1781. His father was temperamentally quite unfit to look after a family, and Laënnec owed his opportunity in life to a paternal uncle, Guillaume, a physician of high intelligence, learned and industrious, who studied in England under Hunter and became Rector of the University of Nantes.

Young Laënnec.

He entered at the School of Medicine at the Hôtel Dieu, Nantes, in September, 1795, being then 14½ years old. It is an indication of the times to find that in the same month he was appointed military surgeon of the Third Class. In 1800 he received the appointment of Officier de Santé and accompanied the expedition sent to quell the insurrection in the Morbihan district. In that year he should have gone to study medicine in Paris, but lack of money prevented him until, in 1801, thanks to his uncle, enough was wrung from Laënnec's father to enable him to do so.

What he did during the remaining 25 years of his life would in any circumstances arouse our wonder, but his accomplishment appears marvellous when we remember that two millstones hung round his neck. The first was his wretched health; he suffered from asthma, angina, neurasthenia, and later from phthisis, and more than once he nearly gave up his career in Paris for a life in the country. The second was his father, whom at last he had partially to support. When Laënnec entered the École de Médecine there were in Paris two schools of thought: that of Pinel, at La Salpêtrière, was the more popular, but was theoretical and interested chiefly in the classification of disease; the other, headed by Corvisart at La Charité, took morbid anatomy as its foundation. The latter attracted Laënnec, and he entered as a student at La Charité, becoming there a fast friend of Bayle. He was a great taker of notes, and during his first three years drew up a minute history of nearly 400 patients. He, Bayle, and Dupuytren were all enthusiastic in the study of morbid anatomy and decided to write a book on the subject, but the project fell through; Laënnec then determined to write one himself, but never completed it. His earliest publication was a description of a case of mitral disease published in 1802.

In September, 1803, he was awarded the Grands Prix in both surgery and medicine. His surgical commentary has been preserved; the subject is axillary aneurysm, for which he favoured amputation at the shoulder. In 1804 he presented a thesis on the application of the doctrines of Hippocrates to practical medicine and four days later received his diploma. The thesis, dedicated to his uncle Guillaume, was printed and attained great success. In his first year of private practice he earned 150 francs, in the second 400; by 1813 he was earning 10,000 francs a year from practice and had attained the position of a fashionable physician. Nevertheless, he continued to work hard in the wards and at the science of medicine, particularly morbid anatomy, so that by the age of 25 he was generally recognised as a chief among morbid anatomists. His power of work was prodigious, for in addition to his medical activities he studied the Breton language, including its relationship to Cornish, Erse, and Gaelic. In 1814 the Parisian hospitals were full of soldiers; Laënnec put those from Brittany, who spoke no French, in separate wards, himself looking after them.

All this time he was perfecting the art of auscultation in the wards of the Necker Hospital; in February, 1818, he read, before the Academy of Sciences, an account of his new method of investigating the respiratory and cardiac sounds, and later on in this year he gave four lectures on the same subject. A few months later still he was able to announce his discovery of ægophony and pectoriloquy. But it is quite likely that all he had done would have remained buried if he had not gathered his observations into that masterpiece "De l'Auscultation Médiate ou Traité du Diagnostic des Maladies des Poumons et du Cœur fondé principalement sur ce nouveau moyen d'exploration," published in two volumes in Paris during August, 1819, at the price of Fr.13. The publishers gave him 7000 francs for the first two editions. A stethoscope cost 3 francs.

In 1818 and again in 1819 Laënnec was very ill; for two years he lived in Brittany, returning to Paris in better health for a further four and a half years of strenuous work. In December, 1821, he started a course of clinical instruction at the Necker Hospital; in 1823 he took charge of the clinic at La Charité; his rounds began at 10 A.M. on five days a week and each lasted two hours. About 50 learners accompanied him, among them many foreigners, for his reputation was European. Most of the time he talked in Latin and he wrote his observations on the cases in this language. In August, 1822, he was elected professor and royal lecturer at the College of France, a post he held till he finally left Paris. Private patients flocked to him in such numbers that he had to restrict himself to consulting practice. He entirely re-wrote his book, publishing a second edition; and in 1824 he married. His health got worse and worse; he recognised that he had phthisis, and in May, 1826, he left Paris for Brittany, where he died in August of the same year.

Laënnec, although he was never actually in England, appears making stethoscopes in Kipling's "Marklake Witches."

> "I saw him (René) and Jerry sitting on the seat and playing with wooden toy trumpets . . . They weren't real trumpets because Jerry opened his shirt collar, and René put one end of his trumpet against Jerry's chest, and put his ear to the other. Then Jerry put his trumpet against René's chest, and listened while René breathed and coughed.
>
> "'This holly wood is one of the best,' said Jerry. 'Tis wonderful like hearin' a man's soul whisperin' in his innards, but unless I have a buzzin' in my ears, Mosheur Lanark, you make much about the same kind of noises as old Gaffer Macklin—but not quite so loud as young Copper. It sounds like breakers on a reef—a long way off. Comprenny?'
>
> "'Perfectly,' said René. 'I drive on the breakers. But before I strike, I shall save hundreds, thousands, millions, perhaps, by my little trumpets.'"

The Discovery of Auscultation.

In the first edition of Laënnec's book we are told, in the following words, how he was led to the discovery of mediate auscultation.

> "In 1816 I was consulted by a young woman presenting general symptoms of disease of the heart . . . The patient's age and sex did not permit me to resort to the kind of examination I have just described (i.e., direct application of the ear to the chest). I recalled a well-known acoustic phenomenon—namely, if you place your ear against one end of a wooden beam the scratch of a pin at the other extremity is most distinctly audible . . . Taking a sheaf of paper I rolled it into a very tight roll, one end of which I placed over the præcardial region, whilst I put my ear to the other. I was both surprised and gratified at being able to hear the beating of the heart with a much greater clearness and distinctness than I had ever done before by the direct application of my ear."

Then follows an account of his experiments as to the best material for making stethoscopes; he finally found that

[2] Leopold Auenbrugger's Inventum Novum. Max Neuburger. Vienna and Leipzic, 1922.

a wooden cylinder with a tube bored down its long axis was the best, the tube being expanded into a funnel-shaped depression at one end. He next tells us how to use the instrument.

Part I. of the book treats of the investigation of the voice sounds by the stethoscope. Laënnec was struck by a most singular phenomenon in a young woman 28 years old, for on listening to the stethoscope applied to a spot under the middle of the right clavicle "her voice seemed to issue directly from the chest and to pass unaltered through the central canal of the instrument." He found this sign in 20 other hospital patients and in all who died a cavity was present where the pectoriloquy, for so he called the sign, had been heard. Thus the discovery of pectoriloquy and its significance was made. Later on, in the chapter on pulmonary phthisis, he tells us that that he "examined post mortem 200 phthisical subjects . . . and on no single occasion failed to find cavities in any part of the lung over which pectoriloquy had been clearly audible." Therefore, he says, "pectoriloquy is a true pathognomonic sign of phthisis."

In Chapter 4 of Part I. he announces the discovery and meaning of ægophony, which resembles pectoriloquy. The voice appears high-pitched, sharp, and silvery, and is quavering and jerky, like the bleating of a goat. He says, "its occurrence appears to me to be restricted to subjects suffering from acute or chronic pleurisy, with a limited amount of effusion in the pleural cavity."

In Part II. we find an account of the investigation of respiratory sounds by the stethoscope as accurate and true to-day as when he wrote it. Part III. begins with an account of râles. They are classified as (1) moist râle or crepitation; (2) mucous râle or gurgling; (3) dry sonorous râle or snoring; (4) dry sibilant râle or whistling. We are told that dry sonorous râles "not infrequently resemble the cooing of a dove. This resemblance is often so close that one is tempted to believe that a dove is hidden under the patient's bed."

The greater part of the two volumes is occupied by diseases of the lungs, but consideration is given to the stethoscopic examination of the heart. Laënnec always supports his statements by illustrative cases, of which the appearances during life and after death are admirably described.

The Place of Laënnec in Medicine.

Before the beginning of the nineteenth century, medicine was almost entirely either empirical or dominated by metaphysical conceptions. Laënnec's book came as a revelation, causing the scales to fall from the eyes of doctors; it taught them that medicine, like other sciences, rests on observation and experiment. He and a few other great men have had the power of observation exalted to such a degree that it becomes genius, a rare gift far less common than high thinking. Verily does Sydenham say: "True practice consists in the observations of nature; these are finer than any speculations." In this astonishing book there occur perfect, precise, and original descriptions of clinical symptoms and post-mortem appearances, neither too long nor too short, for the most part as true now as on the day they were written. Many of them refer to conditions till then unknown, or at least not properly appreciated, such as pulmonary tuberculosis, pneumonia, pulmonary apoplexy, pulmonary œdema, pulmonary gangrene, emphysema, bronchiectasis, hydrothorax, pneumothorax, and some forms of cardiac disease. Laënnec had the power which enabled him to combine isolated observations as to see what they indicated when grouped together; not only did he draw accurate and vivid pictures of the signs and symptoms of particular diseases, but by carrying his gift for clear vision into the post-mortem room he showed that it was possible to predict from observations made during life what would be found after death. He may be said to have been one of the founders of the clinical-morbid anatomy method of studying disease, which, although other methods have since been added, still remains the corner-stone of medicine.

TALKS TO MOTHERS.[1]

WE have received a further instalment of the excellent leaflets by Miss Lily Skene, with the above title, these including Nos. 3 to 6 in the two series dealing respectively with infant care and with character training. While the style in which the leaflets are written is homely, the advice given is uniformly good. The new leaflets on infant care include talks on the care of the premature baby, on summer diarrhœa, on the causes and prevention of constipation, and on the causes and prevention of sickness and loose stools, while the "character" series deal with such topics as unselfishness, honesty, and patience. The practical character of the teaching and the simplicity of the language—to say nothing of the modest price—should ensure for these little papers the wide popularity among nurses and health visitors which they deserve.

[1] Series I. and II., Nos. 3–6, inclusive. By Lily Skene. London: John Bale, Sons, and Danielsson. 1923. 2*d.* each.

COLONIAL HEALTH REPORTS.

St. Helena.

THE estimated civil population on Dec. 31st, 1922, amounted to 3658. The birth-rate in 1922 was 25·88 per 1000, as against 25·3 in the previous year. The death-rate was 9·87 per 1000, as compared with the exceptionally low rate of 6·5 in 1921; this may be taken as working back to the average of about 8·5 per 1000. The general health of the community continued to be satisfactory; influenza of a mild type prevailed in the months of January and February to a moderate extent. A case of measles, complicated by appendicitis, was landed from a mail steamer in January and taken to the hospital, and a severe case of diphtheria occurred in Jamestown in March, but no further cases followed in either instance. A medical examination of all the island children was carried out during the year. The town school-children showed a lower state of nutrition than those in country schools. The proportion of children showing defective teeth would compare most favourably with similar children in England. The vast majority of younger children showed excellent teeth. Cases of enlarged tonsils and adenoids were conspicuous by their absence. There were 174 admissions to the hospital (as compared with 197 in 1921), and there were four deaths. The mean temperature for the year was 61·1° F. The total rainfall measured at Hutts Gate was 42·83 inches, at Plantation 37·12 inches, and in Jamestown 7·55 inches.

New Hebrides.

Mr. M. King, C.M.G., the British Resident Commissioner, in his report to the Colonial Office for 1921–22, explains that the New Hebrides, to which are attached the Banks and Torres Islands, have an area of about 5700 square miles. The natives are Melanesians, but in places there is a mixture of Polynesian blood. A joint naval commission was established in 1888, by agreement with France, to protect the lives and property of British and French subjects and to maintain order. By a Convention of 1906 a condonium was set up with a joint court composed of British and French judges and a neutral president, and an executive government consisting, for some purposes, of the British and French representatives in the group acting in concert. For other purposes British and French nationals remain subject to the control only of their national authorities. The British and French Resident Commissioners are subordinate to the High Commissioner for the Western Pacific and the High Commissioner at Nouméa respectively. A memorandum contributed by Dr. G. Vernon Davies, D.S.O., medical superintendent of the Paton Memorial Hospital, Vila, states that the following diseases are endemic: tuberculosis, malaria, filariasis, amœbiasis, and yaws. These five are, with pneumonia, to which the native is very subject, the chief causes of sickness in the group. Cerebro-spinal fever, influenza, whooping-cough, and mumps have appeared in epidemic form either in 1921 or 1922. The group appears to be free from enteric, plague, cholera, small-pox, yellow fever, bacillary dysentery, and diphtheria. Tuberculosis is the most serious disease that the natives are infected with; it accounts for one-third of all deaths that occur in the hospital. Besides the pulmonary disease, which is the most common, inflammation of the cervical glands is often met with. These show a tendency to very early suppuration. Tuberculous joints and meningitis also occur commonly. The habits of the natives, with a large family living and sleeping in a one-roomed grass house, provides an ideal means of spreading the infection. Malaria is the most widespread disease. Judging by the size of spleen in the native babies few of these escape. All natives are subject to it throughout their lives, but the value of quinine is becoming more recognised throughout the native population, and it is now in demand by all who have seen its good results. Among non-natives malaria is the greatest cause of ill-health, the majority of Europeans suffering from it at intervals. Blackwater fever occurs among Europeans in some islands, notably Epi. Filariasis is distributed throughout the group, but the incidence in the population varies very much in different parts. In some villages in Malekula, between one-third and one-half of the people are suffering from elephantiasis. Muscular swellings, many of which go on to abscess formation, occur very frequently among the natives, and are an important source of ill-health and incapacity. These are probably of filarial origin, though this is one of the things requiring investigation. One or two cases of filaria have occurred among the white population. Amœbiasis remains epidemic throughout the year, but shows a distinct tendency to be epidemic in January and February when flies appear at their worst. It is an important cause of death, attacking and proving fatal in all ages down to infancy. However, the people are recognising the good results that can be obtained with emetine, and it is usually one of the diseases that they will come to the hospital for when they are within reach of attention. It is difficult to

estimate the extent to which yaws exists among the native population. Few babies seem to escape, and sequelæ are seen in several forms among the adults. Gangosa is very often seen. A form of periostitis is very common. It seems to be described as a complication of yaws, but has occurred in Europeans after several years' residence who have had no sign of the primary disease. The tibia is the bone most often affected, but almost any bone seems subject to it, especially those forming the elbow-joint. The neosalvarsan drugs, which are so efficacious in the other manifestations of yaws, seem to have little influence on it, but it responds to potassium iodide. This bone lesion occurs in about 10 per cent. of the people in some villages. Besides the diseases mentioned there are others which do not occur so frequently. Tetanus appears from time to time. Leprosy is scattered about the group, and probably not one of the larger islands is without it. So far these cases have not been isolated or treated except on one island. Syphilis appears to be very rare, but gonorrhœa is becoming increasingly common; ulcerating granuloma is also met with. Tropical ulcer is very prevalent, and this and scabies are the only two skin complaints that interfere with the efficiency of the native. Hookworm has never been investigated in the group, but if this were done it is probable that, as in other islands, a large percentage of the natives would be found affected. Dr. Davies adds that these notes "are based on clinical grounds only, as so far little has been done here in the way of investigating disease. .... It is to be hoped that before long the fact that these islands are still virgin soil pathologically will attract a small laboratory."

A HOBBY FOR NATURE-LOVERS.

THE convalescing patient who has been ordered a prolonged sojourn in the country often finds his interest flagging through lack of a suitable hobby. Golf demanding too great an effort, the days must perforce be spent in gentle rambles among the fields and woods, which all too soon, for the average city dweller, become objectless and dull. A medical man, himself in poor health, tells us of the benefit he found in the occupation of jotting down in a diary short notes about trees, wild flowers, garden flowers, birds, and insects. "This becomes a most fascinating pastime," he writes, "if it is pursued, not in an aimless fashion, but in association with the Phenological Committee of the Royal Meteorological Society. This committee issues yearly a very simple printed form of questions on which the dates of first noticing the appearances of certain plants, birds, and insects can easily be entered. Attention may be confined to one particular set of phenomena, and in some cases two or more friends might unite in filling up a schedule. The expense is limited to the cost of postage, and correspondents sending a sufficient number of observations are supplied gratis with a copy of the annual report. Further particulars may be obtained from one of the hon. secretaries of the committee, at Chartham Park, East Grinstead, Sussex." We recommend this purposeful hobby to practitioners as a suggestion in prescribing for the empty hours of convalescence.

HEROIC TREATMENT FOR HUNTERS.

WE have received from Mr. R. W. Burkitt, F.R.C.S. Irel., of Nairobi, a pamphlet of 24 pages on the treatment of disease for officials, missionaries, settlers, soldiers, and hunters in out-of-the-way parts of Africa remote from a doctor. Five subjects are dealt with—namely, malaria, blackwater, pneumonia, dysentery, and sun. The author's intention to give useful information for intelligent treatment at the early stages of certain diseases is sound enough, but the recommendations transgress the limits permissible for non-medical efforts. As an instance may be quoted some of the advice given as to the diagnosis and early treatment of pneumonia. ". . if the chest is struck smartly with the fist, a spot will be found which causes pain—later on there will be a bloody spittle coughed up." It is then recommended "if he is seen early in the disease, if he be an adult with a normal quantity of blood, he should be bled at once, a pint from one of the big veins of the elbow," further details of the operation being supplied. This and other advice seems to us too heroic to put into the hands of non-medical and non-critical readers.

THE INVESTIGATION OF MOSQUITOES IN ENGLAND.

TILL recently the investigations of the local government boards upon malaria contracted in England in 1917 dealt primarily with the well-known species of anophelines indigenous to Britain—*A. maculipennis* and *A. bifurcatus*. It was then suspected that an elusive tree-hole breeding species, *A. plumbeus*, was capable of transmitting malaria, a suspicion confirmed by laboratory experiments conducted at the Liverpool School of Tropical Medicine. This led to an inquiry addressed to the South-Eastern Union of Scientific Societies [1] upon the range and habits of this species. This work was materially assisted and stimulated by the late Mr. Arthur Bacot to whom a well-deserved tribute is paid. *A. plumbeus* is fairly common in Epping Forest as well as in Richmond Park; the adult insects being found most abundantly in the autumn months, even as late as November. The eggs are laid singly in holes in trees, especially beeches and hornbeams; the half-grown larvæ live throughout the winter. This species has been recorded from various localities in Surrey, from Gloucestershire, and the Isle of Man, and is probably very generally distributed throughout England. There are believed to be two broods in the year. *A. plumbeus* is a timid mosquito, which feeds voraciously on man if undisturbed, but is easily driven off. Probably in nature its normal hosts are birds and small mammals. It will be readily understood that the secretiveness of the habits and the often inaccessible situation of its breeding places render this mosquito most difficult to eradicate.

[1] Transactions of the South-Eastern Union of Scientific Societies, 1923, xxxviii. Preface by Clarence Tierney, D.Sc.

ROYAL ALBERT INSTITUTION, LANCASTER.

THIS charitable foundation was instituted in 1864 for the feeble-minded of the Northern Counties, mainly through the efforts of a former Lancaster physician, Dr. Edward Denis de Vitré. The fifty-ninth annual report contains an interesting retrospect of its history during over half a century and a statement of its present position, together with projects for its extension. During the year, on Sept. 28th, 1923, the quinquennial festival was celebrated and the foundation-stone of a new reception house to take the place of one now used as a tuberculosis sanatorium was laid. Two Commissioners of the Board of Control visited the institution in May, 1923, and commended the excellent work that was being carried on. The report points out that whereas on the occasion of the first quinquennial festival, held in 1873, there were only 141 patients resident, there are now 800 with a prospect of considerable addition when new buildings have been provided for custodial cases. The income in 1873 was £5523, to-day it is £55,042. Altogether 4200 patients have been dealt with in the institution since 1870, four-fifths being reported as improved, in many cases to the extent of earning their own living under kindly supervision, though in the majority even of improved cases discharged from the institution "after care" is essential for the maintenance of permanent benefit. Acknowledgments are made to the various local organisations for raising funds, and the retirement of Sir Charles Brown, for more than 50 years the hon. secretary of the Preston Committee, is chronicled with regret. The training in the workshops (for some dozen trades) has been very successful, and the farm and garden land now consists of 277 acres on which some of the older patients are usefully employed.

The report of Dr. W. H. Coupland, the medical superintendent, for the year ending March 31st, 1923, shows a total of 118 patients admitted, 36 discharged, and 19 died out of a daily average of 760 residents, equivalent to a death-rate of 2·5 per cent., the largest mortality being due to pneumonia in conjunction with influenzal and tuberculous infections. It is stated that for the previous year 1921–22 the death-rate was exceptionally low—only 4 of either sex. Reference is made to the question of the propriety of admitting to institutions under the Mental Deficiency Act patients who have suffered from encephalitis lethargica, and Dr. Coupland expresses the view that "if the damage to the brain is obviously permanent and the children are not above the age of 15 years, then it is justifiable to certify them under the Mental Deficiency Act." As a clinical interest, attention is called to a curious mal-development of the neck and upper thorax existing in one of the female patients as an example of the condition which has been described under the title "les hommes sans cou," but for which Sir Arthur Keith has suggested the term "brevicollis" as a preferable designation. The example at the Institution of this rare condition seems to be unique in respect of the existence of mental deficiency not noted in other cases reported. In conclusion, Dr. Coupland refers to the much discussed subject of sterilisation, and records his view "that it is *real* (eugenic) education that will bring this about, and then a well-instructed public opinion will not need to invoke the law of compulsion."

Prof. A. Kuliabko, of Tomsk University, Siberia, returns thanks to English friends who have sent him books and journals.

The Kind of Nurse She Wants.—In reply to several correspondents, the force of the arguments against two forms of registration was quite clear to us.

Mr. Samson Clark, of East Molesey, chairman of Samson Clark and Co., Ltd., the Advertising Service Agents of Mortimer-street, W., and former Parliamentary candidate for the Chertsey Division of Surrey, asks us to state that he is not in any way connected with someone of the same name, against whom a receiving order in bankruptcy was gazetted last Saturday.